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THE
ZOOLOGICAL RECORD

FOR 1874;

BEING
VOLUME ELEVENTH
OF THE
RECORD OF ZOOLOGICAL LITERATURE.

EDITED BY
EDWARD CALDWELL RYE, F.Z.S., M.E.S.,
EDITOR ENT. M. MAG., LIBRARIAN TO THE ROYAL GEOGRAPHICAL SOCIETY.

Explorate solum : sic fit via certior ultra.

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PREFACE.

IN spite of the arrangements made for a more speedy issue of the present volume, its publication has been delayed, chiefly in consequence of the engagements of the Recorder of *Aves*. This important section has, however, been kindly undertaken, for the next volume, by Mr. OSBERT SALVIN.

I have again the pleasure of acknowledging a grant of £100 from the British Association for the Advancement of Science, and a second contribution of £50 from the Council of the Zoological Society of London, in aid of this undertaking; and I have also to thank my fellow Recorders for their continued co-operation.

EDWARD CALDWELL RYE.

Royal Geographical Society,
1, Savile Row, Burlington Gardens, London,
April, 1876.

Communications, papers, and memoirs intended for this work should be addressed *solely* to "THE EDITOR of the Zoological Record, care of Mr. Van Voorst, 1, Paternoster Row, London." It is earnestly requested that in the case of separately-printed copies of papers so forwarded the *original pagination* be indicated.

LIST OF THE
PRINCIPAL ABBREVIATED TITLES OF JOURNALS
QUOTED IN THIS VOLUME.

- Abh. Ak. Berl.*—Abhandlungen der k. Akademie der Wissenschaften zu Berlin.
- Abh. Ges. Görl.*—Abhandlungen der naturforschenden Gesellschaft zu Görlitz.
- Abh. senck. Ges.*—Abhandlungen herausgegeben von der senckenbergischen naturforschenden Gesellschaft.
- Abh. Ver. Brem.*—Abhandlungen herausgegeben vom naturwissenschaftlichen Verein zu Bremen.
- Abh. Ver. Magdeb.*—Abhandlungen des naturwissenschaftlichen Vereins zu Magdeburg.
- Act. Soc. Esp.*—Actas de la Sociedad Española de Historia Natural.
- Act. Soc. L. Bord.*—Actes de la Société Linnéenne de Bordeaux.
- Am. J. Sci.* (3).—American Journal of Science and Art. Third series.
- Am. Nat.*—American Naturalist.
- Ann. Ent.*—Annuaire entomologique (Fauvel).
- Ann. Ent. Belg.*—Annales de la Société entomologique de Belgique.
- Ann. Lyc. N. York.*—Annals of the Lyceum of Natural History of New York.
- Ann. Mal. Belg.*—Annales de la Société malacologique de Belgique.
- Ann. Mus. Genov.*—Annali del Museo civico di Storia naturale di Genova.
- Ann. Mus. Nap.*—Annuario del Museo Zoologico della R. Università di Napoli.
- Ann. N. H.* (4).—Annals and Magazine of Natural History. Fourth series.
- Ann. Sci. Nat.* (5).—Annales des Sciences Naturelles. 5me série.
- Ann. Soc. Ent. Fr.* (5).—Annales de la Société entomologique de France. 5me série.
- Ann. Soc. Mod.*—Anuario della Società dei Naturalisti di Modena.
- An. Soc. Esp.*—Anales de la Sociedad Española de Historia Natural.
- An. Univ. Chil.*—Anales de la Universidad di Chile.
- Arb. Inst. Würzb.* (2).—Arbeiten aus dem zoologisch-zootomischen Institut in Würzburg. Neue Folge.

Arb. Petersb. Ges.—Arbeiten der St. Petersburger Gesellschaft der Naturforscher.

Arch. Anat. Phys.—Archiv für pathologische Anatomie und Physiologie.

Arch. f. Nat. (2).—Archiv für Naturgeschichte. Neue Folge.

Arch. mikr. Anat.—Archiv für mikroskopische Anatomie.

Arch. Miss. Sci. (3).—Archives des Missions scientifiques et littéraires. 3me série.

Arch. Nat. Livl.—Archiv für die Naturkunde Liv- Ehst- und Kurlands.

Arch. Néerl.—Archives Néerlandaises des Sciences exactes et naturelles.

Arch. Phys.—Archives de Physiologie normale et pathologique.

Arch. sci. nat.—Archives Néerlandais des Sciences exactes et naturelles.

Arch. Ver. Mecklenb.—Archiv des Vereins der Freunde der Naturgeschichte in Mecklenburg.

Arch. Z. expér.—Archives de Zoologie expérimentale et générale.

Atti Acc. Nap.—Atti dell' Accademia di Scienze fisiche e matematiche di Napoli.

Atti Acc. Rom.—Atti della R. Accademia dei Lincei.

Atti Acc. Tor.—Atti della R. Accademia delle Scienze di Torino.

Atti Ist. Venet.—Atti del R. Istituto Veneto di Scienze, &c.

Atti Soc. Ital.—Atti della Società Italiana di Scienze naturali.

Atti Soc. Pad.—Atti della Società Veneto-Trentina di Scienze naturali.

Ber. Ges. Chemn.—Bericht der naturwissenschaftlichen Gesellschaft zu Chemnitz.

Ber. offenb. Ver.—Bericht über die Thatigkeit des offenbacher Vereins für Naturkunde.

Ber. senck. Ges.—Bericht der senckenbergischen naturforschenden Gesellschaft.

Ber. St. Gal. Ges.—Bericht über die Thätigkeit der St. Gallischen naturwissenschaftlichen Gesellschaft.

Ber. Ver. Cass.—Bericht des Vereins für Naturkunde zu Cassel.

B. E. Z.—Berliner entomologische Zeitschrift.

Bol. Ac. Cordova.—Boletin de la Academia nacional de Ciencias exactas existente en la Universidad de Cordova.

Bull. Ac. Belg. (2).—Bulletin de l'Académie Royale des Sciences de Belgique. 2me série.

Bull. Buff. Soc.—Bulletin of the Society of Natural Sciences, Buffalo.

Bull. Ent. Ital.—Buletino della Società Entomologica Italiana.

Bull. Ent. Ross.—Bulletin Societatis entomologicæ Rossicæ.

Bull. Ess. Inst.—Bulletin of the Essex Institute.

Bull. Minnes. Ac.—Bulletin of the Minnesota Academy of Science.

Bull. Mosc.—Bulletin de la Société impériale des Naturalistes de Moscou.

Bull. Mus. C. Z.—Bulletin of the Museum of Comparative Zoology (Cambridge, U. S. A.).

Bull. Pétersb.—Bulletin de la classe physico-mathématique de l'Académie impériale des Sciences de St. Petersbourg.

Bull. Soc. Acclim. (3).—Bulletin de la Société d'Acclimatation. 3me série.

Bull. Soc. Angers.—Bulletin de la Société d'études scientifiques d'Angers.

- Bull. Soc. Colm.*—Bulletin de la Société d'histoire naturelle de Colmar.
- Bull. Soc. Ent. Fr.*—Bulletin des séances de la Société entomologique de France.
- Bull. Soc. Géogr.*—Bulletin de la Société de Géographie.
- Bull. Soc. Géol. (3).*—Bulletin de la Société géologique de France. 3me série.
- Bull. Soc. Géol. Norm.*—Bulletin de la Société géologique de Normandie.
- Bull. Soc. L. N. Fr.*—Bulletin mensuel de la Société Linnéenne du Nord de la France.
- Bull. Soc. L. Norm.*—Bulletin de la Société Linnéenne de Normandie.
- Bull. Soc. Neuch.*—Bulletin de la Société des sciences naturelles de Neuchâtel.
- Bull. Soc. Pyrén.*—Bulletin de la Société agricole scientifique et littéraire des Pyrénées orientales.
- Bull. Soc. Sci. Lyon.*—Bulletin de la Société d'études scientifiques de Lyon.
- Bull. Soc. Toulouse.*—Bulletin de la Société d'histoire naturelle de Toulouse.
- Bull. Soc. Vaud.*—Bulletin de la Société Vaudoise des Sciences Naturelles.
- Bull. Soc. Vétér.*—Bulletin de la Société centrale de Médecine Vétérinaire.
- Bull. Soc. Yonne.*—Bulletin de la Société des Sciences historiques et naturelles de l'Yonne.
- Bull. U. S. Geol. Surv.*—Bulletin of the United States Geological and Geographical Survey of the Territories.
- Canad. Ent.*—Canadian Entomologist.
- Canad. Nat. (n. s.).*—Canadian Naturalist and Quarterly Journal of Science. New Series.
- Cat. Mus. C. Z.*—Illustrated Catalogue of the Museum of Comparative Zoölogy (Cambridge, U. S. A.).
- CB. afrik. Ges.*—Correspondenz-Blatt der afrikanischen Gesellschaft (Berlin).
- CB. Ver. Regensb.*—Correspondenz-Blatt des zoologisch-mineralogischen Vereins in Regensburg.
- CB. Ver. Riga.*—Correspondenz-Blatt des naturforschenden Vereins zu Riga.
- C. H.*—Coleopterologische Hefte.
- Cincinn. Q. J. Sc.*—Cincinnati Quarterly Journal of Science.
- Cist. Ent.*—Cistula Entomologica.
- C. R.*—Comptes rendus des séances hebdomadaires de l'Académie des Sciences.
- CR. Ent. Belg.*—Comptes-rendus des séances de la Société entomologique de Belgique.
- Denk. Ak. Wien.*—Denkschriften der k. Akademie der Wissenschaften zu Wien.

Ent.—The Entomologist.

Ent. Ann.—The Entomologist's Annual.

Ent. M. M.—Entomologist's Monthly Magazine.

Feuil. Nat.—Feuilles des jeunes Naturalistes.

Förh. Selsk. Chr.—Förhandlingar i Videnskabs-Selskabet i Christiania.

Förh. Sk. Naturf.—Förhandlingar vid det af Skandinaviska Naturforskare och Läkare möte.

Geol. Mag.—Geological Magazine.

Göteb. Handl. (2).—Göteborg's K. Vetenskaps och Vitterhets Samhälles Handlingar. Ny Tidsföljd.

Hor. Ent. Ross.—Horæ Societatis Entomologicæ Rossicæ.

Ibis.—The Ibis.

J. Ac. Philad.—Journal of the Academy of Natural Sciences of Philadelphia.

J. Anat. Phys.—Journal of Anatomy and Physiology.

J. A. S. B. (n. s.).—Journal of the Asiatic Society of Bengal. New Series.

JB. Anat. Physiol.—Jahresbericht für Anatomie und Physiologie (Sshwalbe & Hoffmann).

JB. f. Mineral.—Neues Jahrbuch für Mineralogie, Palæontologie und Geologie.

JB. Geol. Reichsanst.—Jahrbuch der k.-k. geologischen Reichsanstalt; Wien.

JB. Ges. Graub. (2).—Jahresbericht der naturforschenden Gesellschaft Graubündens. Neue Folge.

JB. Ges. Hannov.—Jahresbericht der naturforschenden Gesellschaft in Hannover.

JB. mal. Ges.—Jahrbuch der deutschen malakozoologischen Gesellschaft.

JB. nass. Ver.—Jahrbücher des nassauischen Vereins für Naturkunde.

JB. schles. Ges.—Jahresbericht der schlesischen Gesellschaft für vaterländische Cultur.

JB. ungar. Geol. Anst.—Jahrbuch der königl. ungarischen geologischen Anstalt.

JB. Ver. Augsb.—Jahresbericht des naturhistorischen Vereins zu Augsburg.

JB. Ver. Zwickau.—Jahresbericht des Vereins für Naturkunde zu Zwickau.

J. de Conch.—Journal de Conchyliologie.

J. de l'Anat. Phys.—Journal de l'anatomie et de la physiologie.

Jen. Z. Nat.—Jenaische Zeitschrift für Medicin und Naturwissenschaft.

J. f. O.—Journal für Ornithologie.

J. G. Soc.—Quarterly Journal of the Geological Society.

J. Hort. Soc. (n. s.).—Journal of the Royal Horticultural Society. New series.

JH. Ver. Württ.—Jahreshefte des Vereins für vaterländische Naturkunde in Württemberg.

J. Inst. Cornw.—Journal of the Royal Institution of Cornwall.

J. L. S.—Journal of the Linnean Society.

J. Mus. Godeffr.—Journal des Museum Godeffroy: Geographische ethnographische und naturwissenschaftliche Mittheilungen.

J. N. China Soc.—Journal of the North-China Branch of the Royal Asiatic Society.

J. R. G. Soc. Irel.—Journal of the Royal Geological Society of Ireland.

J. Sc. Lisb.—Jornal de Sciencias da Academia de Lisboa.

J. Zool.—Journal de Zoologie.

L'Ab.—L'Abeille.

Mal. Bl.—Malakozoologische Blätter.

MB. Ak. Berl.—Monatsberichte der k. Akademie der Wissenschaften zu Berlin.

Mél. Biol.—Mélanges biologiques tirés du Bulletin de la classe physico-mathématique de l'Académie Impériale des Sciences de St. Pétersbourg.

Mém. Ac. Belg.—Mémoires de l'Académie Royale des Sciences de Belgique.

Mem. Acc. Bologn.—Memorie dell' Accademia di Scienze dell' Istituto di Bologna.

Mem. Am. Ac.—Memoirs of the American Academy of Arts and Sciences.

Mem. Bost. Soc.—Memoirs of the Boston Society of Natural History.

Mém. cour. Ac. Belg.—Mémoires couronnés publiés par l'Académie Royale des Sciences de Belgique.

Mém. Liège.—Mémoires de la Société R. des Sciences de Liège.

Mém. Pétersb. (7).—Mémoires de l'Académie impériale des Sciences de St. Pétersbourg. 7me série.

Mém. Soc. Cherb. (2).—Mémoires de la Société des sciences naturelles de Cherbourg. 2me série.

Mém. Soc. L. N. Fr.—Mémoires de la Société Linnéenne du Nord de la France.

M. Micr. J.—Monthly Microscopical Journal.

MT. Ges. Bern.—Mittheilungen der naturforschenden Gesellschaft in Bern.

MT. Ges. Ostas.—Mittheilungen der deutschen Gesellschaft für Natur- und Völkerkunde Ostasiens (Yokohama).

MT. schw. ent. Ges.—Mittheilungen der schweizerischen entomologischen Gesellschaft.

MT. Ver. Reich.—Mittheilungen aus dem Verein der Naturfreunde in Reichenberg.

Nachr. Ges. Götting.—Nachrichten von der k. Gesellschaft der Wissenschaften zu Göttingen.

Nachr. Ges. Mosc.—Nachrichten der k. Gesellschaft der Liebhaber der Naturkunde zu Moskau.

- Nachr. mal. Ges.*—Nachrichtsblatt der deutschen malako-zoologischen Gesellschaft.
- N. Act. L.-C. Ac.*—Nova Acta physico-medica Academiæ Cæs. Leopoldino-Carolinæ Naturæ curiosorum.
- N. Arch. Mus.*—Nouvelles Archives du Muséum d'Histoire Naturelle.
- Nat. Canad.*—Le Naturaliste Canadien.
- Nat. Mex.*—La Naturaleza.
- Nat. Tids.*—Naturhistorisk Tidsskrift.
- Nature.*—Nature.
- N. Denk. schw. Ges.*—Neue Denkschriften der allgemeinen schweizerischen Gesellschaft für die gesammten Naturwissenschaften.
- Niederl. Arch. Zool.*—Niederländisches Archiv für Zoologie.
- N. Mag. Naturv.*—Nyt Magazin for Naturvidenskaberne.
- Not. Fenn.*—Notiser ur Sällskapets pro Fauna et Flora Fennica Förhandlingar.
- Nouv. et Faits.*—Nouvelles et Faits divers.
- Nunq. Ot.*—Nunquam Otiosus.
- Œfv. Ak. Förh.*—Œfversigt af K. Vetenskaps Akademiens Förhandlingar.
- Œfv. Fin. Soc.*—Œfversigt af Finska Vetenskaps-Societetens Förhandlingar.
- Opusc. ent.*—Opuscula entomologica (Lund).
- Overs. Dan. Selsk.*—Oversigt over det K. Danske Videnskabernes Selskabs Forhandlinger.
- P. Ac. Chic.*—Proceedings of the Academy of Sciences of Chicago.
- P. Ac. Philad.*—Proceedings of the Academy of Natural Sciences of Philadelphia.
- Pal. Soc.*—[Publications of the] Palæontographical Society.
- P. Am. Ass.*—Proceedings of the American Association for the Advancement of Science.
- P. Am. Phil. Soc.*—Proceedings of the American Philosophical Society.
- P. Bath Club.*—Proceedings of the Bath Natural-History and Antiquarian Field Club.
- P. A. S. B.*—Proceedings of the Asiatic Society of Bengal.
- P. Belf. Soc.*—Proceedings of the Belfast Natural-History Society.
- P. Berw. Club.*—Proceedings of the Berwickshire Naturalists' Field Club.
- P. Bost. Soc.*—Proceedings of the Boston Society of Natural History.
- P. Cal. Ac.*—Proceedings of the California Academy of Sciences.
- P. Conn. Ac.*—Proceedings of the Connecticut Academy of Sciences.
- Period. Zool. Argent.*—Periodico zologico: Organo de la Sociedad entomologica Argentina.
- P. E. Soc.*—Proceedings of the Entomological Society of London.
- Pet. Nouv.*—Petites Nouvelles Entomologiques.
- Phil. Tr.*—Philosophical Transactions of the Royal Society.
- P. Liverp. Geol. Soc.*—Proceedings of the Geological Society of Liverpool.

- P. Liverp. Soc.*—Proceedings of the Literary and Philosophical Society and Natural History Society of Liverpool.
- P. Ottawa Ac.*—Proceedings of the Ottawa Academy of Natural Science.
- Pop. Sci. Rev.*—Popular Science Review.
- P. R. Inst.*—Proceedings of the Royal Institution of Great Britain.
- P. R. Irish Ac.*—Proceedings of the Royal Irish Academy.
- P. R. Soc.*—Proceedings of the Royal Society.
- P. R. Soc. Edinb.*—Proceedings of the Royal Society of Edinburgh.
- P. R. Soc. Tasm.*—Proceedings of the Royal Society of Tasmania.
- P. Soc. Manch.*—Proceedings of the Literary and Philosophical Society of Manchester.
- Psyche.*—Psyche: Organ of the Cambridge [U. S. A.] Entomological Club.
- P.-v. Mal. Belg.*—Procès-verbaux des séances de la Société malacologique de Belgique.
- P. Z. S.*—Proceedings of the Zoological Society.
- P. Z. S. Vict.*—Proceedings of the Zoological and Acclimatization Society of Victoria.
- Q. J. Sci. (2).*—Quarterly Journal of Science. Second Series.
- Q. J. Micr. Sci.*—Quarterly Journal of Microscopical Science.
- Rend. Acc. Nap.*—Rendiconti dell' Accademia di scienze fisiche e matematiche di Napoli.
- Rend. Acc. Bologn.*—Rendiconto dell' Accademia di scienze dell' Istituto di Bologna.
- Rep. Br. Ass.*—Report of the British Association for the Advancement of Science.
- Rep. Comm. Agric.*—Report of the Commissioner of Agriculture (Washington).
- Rep. Ins. Mo.*—Annual Report on the noxious, beneficial, and other Insects of the State of Missouri, made to the State Board of Agriculture.
- Rep. N. York Mus.*—Annual Report of the New York State Museum of Natural History.
- Rep. Peab. Ac.*—Annual Report of the Trustees of the Peabody Academy of Arts and Sciences.
- Rep. Sm. Inst.*—Annual Report of the Board of Regents of the Smithsonian Institution.
- Rev. d'Anthr.*—Revue d'Anthropologie.
- Rev. Montp.*—Revue des Sciences Naturelles (Montpellier).
- Rev. Soc. sav. (2).*—Revue des Sociétés savantes. 2me série.
- R. Z. (3).*—Revue et Magasin de Zoologie pure et appliquée. 3me série.
- SB. Ak. Wien.*—Sitzungsberichte der mathematisch-naturwissenschaftlichen Classe der k. Akademie der Wissenschaften; Wien.
- SB. bayer. Ak.*—Sitzungsberichte der mathematisch-physikalischen Classe der K. bayerischen Akademie der Wissenschaften.
- SB. böhm. Ges.*—Sitzungsberichte der k. böhmischen Gesellschaft der Wissenschaften.

- SB. Ges. Dorp.*—Sitzungsberichte der Dorpater Naturforscher Gesellschaft.
- SB. Ges. Leipzig.*—Sitzungsberichte der naturforschenden Gesellschaft zu Leipzig.
- SB. Ges. Marb.*—Sitzungsberichte der Gesellschaft zur Beförderung der gesammten Naturwissenschaften zu Marburg.
- SB. nat. Fr.*—Sitzungsberichte der Gesellschaft naturforschender Freunde zu Berlin.
- SB. Soc. Erlang.*—Sitzungsberichte der physicalish-medicinischen Societät zu Erlangen.
- Schr. Ges. Danz.*—Neueste Schriften des naturforschenden Gesellschaft zu Danzig.
- Schr. Ges. Königsb.*—Schriften der k. physikalisch-ökonomischen Gesellschaft in Preussen.
- Schr. Ver. Schlesw. Holst.*—Schriften des naturwissenschaftlichen Vereins für Schleswig-Holstein (Kiel).
- Sci. Gos.*—Science Gossip.
- Scot. Nat.*—The Scottish Naturalist.
- S. E. Z.*—Stettiner entomologische Zeitung.
- Sm. misc. Coll.*—Smithsonian miscellaneous Collections.
- Str. Feath.*—Stray Feathers.
- Sv. Ak. Handl.*—K. Svenska Vetenskaps Akademiens Handlingar.
- Tids. Fisk.*—Tidsskrift for Fiskeri.
- Tijdschr. Ent.*—Tijdschrift voor Entomologie.
- Tijdschr. Ned. Dierk. Ver.*—Tijdschrift der Nederlandsche Dierkundige Vereeniging.
- Tr. Ac. St. Louis.*—Transactions of the Academy of Sciences of St. Louis.
- Tr. Am. Ent. Soc.*—Transactions of the American Entomological Society.
- Tr. Am. Phil. Soc. (n. s.).*—Transactions of the American Philosophical Society. New Series.
- Tr. E. Soc.*—Transactions of the Entomological Society of London.
- Tr. Geol. Soc. Edinb.*—Transactions of the Edinburgh Geological Society.
- Tr. L. S.*—Transactions of the Linnean Society.
- Tr. North. Dur.*—Natural-History Transactions of Northumberland and Durham.
- Tr. Norw. Soc.*—Transactions of the Norfolk and Norwich Naturalists' Society.
- Tr. N. York Agric. Soc.*—Transactions of the New York State Agricultural Society.
- Tr. N. Z. Inst.*—Transactions and Proceedings of the New Zealand Institute.
- Tr. R. Soc. Edinb.*—Transactions of the Royal Society of Edinburgh.
- Tr. R. Soc. Maur.*—Transactions of the Royal Society of Arts and Sciences of Mauritius.
- Tr. Soc. Kharkow.*—Travaux de la Société des Naturalistes à l'Université Impériale de Kharkow.
- Tr. Z. S.*—Transactions of the Zoological Society.

Verh. geol. Reichsanst.—Verhandlungen der k. k. geologischen Reichsanstalt; Wien.

Verh. Ges. Würzb. (2).—Verhandlungen der physikalisch-medicinischen Gesellschaft in Würzburg. Neue Folge.

Verh. Holl. Maatsch.—Natuurkundige Verhandelingen van de Hollandse Maatschappij der Wetenschappen.

Verh. L.-C. Ak.—Verhandlungen der k. Leopold. Carol. deutschen Akademie der Naturforscher.

Verh. schw. Ges.—Verhandlungen der schweizerischen naturforschenden Gesellschaft.

Verh. siebenb. Ver.—Verhandlungen des siebenbürgischen Vereins für Naturwissenschaften.

Verh. Ver. Brünn.—Verhandlungen des naturforschenden Vereins in Brünn.

Verh. Ver. Hamb.—Verhandlungen des Vereins für naturwissenschaftliche Unterhaltung zu Hamburg.

Verh. Ver. Heidelb.—Verhandlungen des naturhistorisch-medicinischen Vereins zu Heidelberg.

Verh. Ver. Rheinl.—Verhandlungen des naturhistorischen Vereins der preussischen Rheinlande und Westphalens.

Verh. z.-b. Wien.—Verhandlungen der zoologisch-botanischen Gesellschaft in Wien.

Versl. Ak. Amst.—Verslagen en Mededeelingen der k. Akademie van Wetenschappen; Amsterdam.

Vid. Medd.—Videnskabelige Meddelelser fra den Naturhistoriske Forening.

Würt. nat. JH.—Württembergische naturwissenschaftliche Jahreshefte.

Z. Biol.—Zeitschrift für Biologie.

Z. geol. Ges.—Zeitschrift der deutschen geologischen Gesellschaft.

Z. ges. Naturw. (2).—Zeitschrift für die gesammten Naturwissenschaften. Neue Folge.

Zool. Gart.—Der Zoologische Garten.

Zool. Rec.—Record of Zoological Literature (and Zoological Record).

Zool. (s. s.).—The Zoologist. Second Series.

Z. wiss. Zool.—Zeitschrift für wissenschaftliche Zoologie.



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ZOOLOGICAL RECORD

FOR 1874.

MAMMALIA.

BY

EDWARD RICHARD ALSTON, F.Z.S.

SEVERAL works of importance have been added to the literature of this class in the past year. Of these attention may be specially directed to the completion of H. & A. Milne-Edwards' admirable memoirs (*infra*, p. 4), to Lilljeborg's Mammals of Scandinavia (p. 3), to Scammon's interesting addition to our knowledge of the fauna of the North Pacific (p. 4), and to the continuation of Van Beneden & Gervais' great work on the Cetacea (p. 11). Gray's List of the Seals in the British Museum (p. 3) may be noticed as the last of the very long series of that indefatigable naturalist's contributions to science. As in 1873, special notice is due to the labours of Leidy (p. 14), Marsh (pp. 4, 13), and Cope (p. 2), among the remains of the Mammals of the American Tertiary periods; unfortunately, their very valuable facts appear to accumulate with such rapidity as to cause some confusion in nomenclature and systematic arrangement.

THE GENERAL SUBJECT.

ALLEN, J. A. Notes on the Natural History of portions of Dakota and Montana; Mammals. P. Bost. Soc. xvii. pp. 37-43.

A list of 31 species collected during the North Pacific Railroad Expedition of 1873.

BELL, T. History of British Quadrupeds, second edition, revised and partly rewritten by the author, assisted by R. F. Tomes and E. R. Alston. London: 1874. 8vo, pp. 474, woodcuts.

1874. [VOL. XI.]

B

The original edition of 1839 is revised throughout, the orders *Chiroptera* and *Insectivora* by Mr. Tomes, the *Carnivora*, *Pinnipedia*, *Ruminantia*, and *Cetacea* by the Recorder, and the remainder by the author. The domestic animals and 7 other species included in the first edition are omitted, while 13 others are added, of which 10 are Cetaceans. 73 species of British Mammals are recognized, of which 3 (*Vespertilio murinus*, *Phoca grœnlandica*,* and *Balœna mysticetus*) are regarded as doubtful.

BOYD-DAWKINS, W. Cave Hunting, Researches on the Evidence of Caves respecting the Early Inhabitants of Europe. London: 1874. 8vo, pp. 455.

Gives an excellent popular account not only of the relics of mankind, but of the distribution of the Pleistocene Mammals of Europe.

BRONN, H. G. [See GIEBEL, C. G.]

BUNGE, G. Der Kali-, Natron-, und Chlorgehalt der Milch, verglichen mit dem anderer Nahrungsmittel und des Gesamtorganismus der Säugethiere. Z. Biol. x. pp. 295-335.

Treats of the chemical constitution of the milk of various Mammals.

CHATIN, J. Recherches pour servir à l'histoire anatomique des glandes odorantes des Mammifères. Ann. Sc. Nat. (5) xix. pp. 1-135. pls. i.-ix.

The odoriferous glands of many species of *Carnivora* and *Glires* are described and figured.

COPE, E. D. Report on the Stratigraphy and Pliocene Vertebrate Paleontology of Northern Colorado. Bull. U. S. Geol. Surv. 1874, pp. 9-28.

— On the Extinct Vertebrata of the Eocene of Wyoming; Mammalia. Report U. S. Geological Survey of the Territories for 1872 (1873), pp. 546-612.

— Special Reports on Paleontology; Mammalia. *Op. cit.* 1873 (1874), pp. 456-533.

The above papers give much additional information as to the remarkable tertiary fauna of the Territories, especially regarding the recently discovered forms of *Primates*, *Carnivora*, and *Ungulata*.

— Synopsis of New Vertebrata from the Territory of Colorado. (1873.) [Not seen by the Recorder.]

— On the Homologies and Origin of the Types of Molar Teeth in Mammalia Educabilia. J. Ac. Philad. viii. pp. 71-89.

This paper, of which an abstract has already been noticed [*cf.* Zool. Rec. x. p. 2], is now printed at length.

FERRIER, D. The Localization of Function in the Brain (abstract). P. R. Soc. xxii. pp. 229-232 [*cf.* Zool. Rec. x. p. 2].

FISCHER, J. VON. Beobachtungen über Kreuzungen verschiedener Farbenspielarten innerhalb einer Species. Zool. Gart. 1874, pp. 361-374.

* *Cf. infra*, p. 10.

From the results of a very large series of experiments in crossing variously coloured varieties of Rats, Hamsters, &c., the author finds the influence of the male to predominate. When two different varieties are paired an uncertain proportion of melanism appears in the offspring. The production of young of an intermediate colouration is regarded as showing the specific distinction of the parents.

GERVAIS, P. Remarques sur les formes cérébrales propres aux Thalassothériens. J. Zool. iii. pp. 570–583, pl. xix.

Remarks on the form of the cranial cavity and brain in the various marine Mammals, as Seals, Zeuglodonts, Cetaceans, and Sirenians. The plate represents the brains of *Halichore*, *Macrorhinus*, *Lobodon*, and *Otaria*, a natural cast of the cranial cavity of *Glyphidephus sulcatus*, and the posterior part of the skull of *Zeuglodon cetoides*.

GIEBEL, C. G. Dr. H. S. Bronn's Klassen und Ordnungen des Thier-Reichs, vi. pt. 5, Mammalia; Nos. 1–5. Leipzig & Heidelberg: 1874. 8vo, pp. 1–80, pls. i.–xxiv.

Dr. Giebel has commenced to treat of the Mammalia in the same manner adopted in other portions of this work [*cf.* Zool. Rec. vi. p. 30]. The numbers published give preliminary observations, and then proceed to the description of the bones of the skull.

GRAY, J. E. Handlist of Seals, Morses, Sea-Lions, and Sea-Bears in the British Museum. London: 1874. 8vo, pp. 43, pls. i.–xxx.

Similar to the author's previous catalogues.

GRUBER, WENZEL. Ueber die Verbindung Schläfenbeinschuppe mit dem Stirnbeine. Mém. Pétersb. (7) xxi. No. 5, pp. 29, pls. 2.

Treats of the articulation of the temporal and frontal bones in Man and in the different orders of Mammalia.

——. Ueber die infraorbitalkanäle bei dem Menschen und bei den Säugethieren. *Tom. cit.* No. 10, pp. 27, pls. 2.

GUNDLACH, J. Catálogo de los Mamíferos Cubanos. Ann. Soc. Esp. i. (1873) pp. 232–258.

The native species are 24; namely, 19 Bats, 1 Insectivore, 3 Rodents, and 1 Sirenian, besides two or three undetermined Cetaceans, and the introduced Rat and Mouse.

HEUGLIN, M. TH. VON. Reisen in dem Nordpolarmeer in den Jahren 1870 und 1871. Pt. 3. Braunschweig: 1874. 8vo, pp. 352.

Nineteen Mammals are natives of Spitzbergen and Nova-Zembla (pp. 3–78), including 9 Carnivores, 7 Cetaceans, 2 Rodents, and 1 Ungulate.

KÖLLIKER, A. Ueber die Entwicklung der Graaf'schen Follikel der Säugethiere. Verh. Ges. Würzb. viii. pp. 92–95.

LEISERING, A. G. T. Atlas der Anatomie des Pferdes und der übrigen Hausthiere. Leipzig: 1866–1874. Sm. fol. 2 vols. pp. 155, pls. i.–xliii.

Illustrations of the anatomy of the Horse, Ox, Sheep, &c.

LILLJEBORG, W. Sweriges och Norges Rygggradsdjur. I. Däggdjuren. Upsala: 1874. 8vo, pp. 1088.

A complete account of the Mammals of Scandinavia, with remarks on classification, and a considerable amount of anatomical detail; notes on some of the more important exotic and fossil forms are also introduced. 92 native species are recognized, of which 23 are Cetaceans.

MARSH, O. C. On the small size of the Brain in the Mammalia of the Tertiary Times. P. Conn. Ac. 1874.

All the earlier animals were inferior in cerebral volume to their successors. Thus the brain was proportionately smaller in the Eocene *Tinoceras* and *Uintatherium* than in the Miocene *Brontotherium*, which again was surpassed by the Pliocene *Mastodon*. The same facts are observed in the fossil *Equidae*. [Not seen by the Recorder; cf. J. Zool. iii. pp. 326 & 327, Ann. N. H. (4) xiv. p. 167.]

MILNE-EDWARDS, H. & A. Recherches pour servir à l'Histoire Naturelle des Mammifères. Paris: 1868-1874. 2 vols. 4to, pp. 394, pls. i.-lxxxii.

This beautiful work, of which the earlier parts have been already noticed [cf. Zool. Rec. v. p. 3, vi. p. 2, viii. p. 2, and ix. p. 2], has been brought to a conclusion by the completion of A. Milne-Edwards' memoir on the Mammals of Thibet. Many rare animals are figured for the first time, and 3 new species are described.

PARKER, W. K. On the Structure and Development of the Skull in the Pig (*Sus scrofa*). Phil. Tr. 1874, pp. 289-336, pls. xxviii.-xxxvii.

The Pig is here taken as a type of the class, and the development of its cranium is carefully worked out. Of the auditory ossicles the *stapes* is developed from the auditory capsule, the *malleus* from the mandibular arch, and the *incus* from the hyoidean arch.

PYE-SMITH, P. H. Catalogue of the Preparations of Comparative Anatomy in the Museum of Guy's Hospital. London: 1874. 8vo, pp. 294.

The characters of the various classes and orders are shortly stated, and attention is called to the principal structural modifications of each form, so that the catalogue will form a useful handbook to students who have access to the collection.

REICHERT, C. B. Beschreibung einer frühzeitigen menschlichen Frucht im bläschenförmigen Bildungszustande, nebst vergleichenden Untersuchungen über die bläschenförmigen Früchte der Säugethiere und des Menschen. Abh. Ak. Berl. 1873, pp. 1-92, pls. i.-v.

SCAMMON, C. M. The Marine Mammals of the North-Western Coast of North America described and illustrated, together with an account of the American Whale Fishery. San Francisco and New York: 1874. 4to, pp. 319, pls. i.-xxvii.

The author's object is to give correct figures and descriptions of the Cetaceans and Pinnipeds of the American Pacific Coast, with full details of their habits as observed by himself. The species figured, many of them for the first time, will be referred to in the special part. The plates, from the author's own sketches, are carefully executed, and the account of the habits and chase of the animals is full of interest. No

new species are described. W. H. Dall adds in an appendix a full catalogue of the North Pacific Cetaceans, of which he regards about 44 species as being well established.

SCHULTZ, A. Notice sur les pêcheries et la chasse aux Phoques dans la Mer Blanche, l'Océan Glacial, et la Mer Caspienne. St. Petersburg : 1873. 8vo, pp. 80.

An official report on the fisheries and on the chase of the Polar Bear, Walrus, Seals, White Whale, &c., on the Arctic and Caspian shores of Russia.

TEUTLEBEN, E. VON. Ueber Kaumuskeln und Kaumechanismus bei den Wirbelthieren. Arch. f. Nat. 1874, pp. 78-111, pl. ii.

Treats of the masticatory apparatus of Mammals, as well as of other Vertebrates.

TROSCHER, F. H. Bericht über die Leistungen in der Naturgeschichte der Säugethiere während des Jahres 1873. Arch. f. Nat. 1874, ii. pp. 107-145.

UMBER, F. Schädelmessungen. Verh. Ver. Rheinl., xxx. (1873) pp. 46-67.

On the proportion of the brain-case to the rest of the skull in various Mammals, with many measurements, and on their relationship to the amount of intelligence in the various orders.

WEISKE, H., & WILDT, E. Untersuchungen über Fettbildung im Thierkörper. Z. Biol. x. pp. 1-20.

Observations on the development of fat in the Pig.

J. A. ALLEN remarks on the changes of animals in connection with their geographical distribution. P. Bost. Soc. xv. p. 157.

A. E. AMES gives a nominal list of 63 Mammals indigenous to Minnesota. Bull. Minnes. Ac. 1874, pp. 68-71.

G. BUSK reports on the animal remains found during the exploration of the Brixham Cave, including about 20 species of Mammals. Phil. Tr. 1873, pp. 499-548, pls. xlv.-xlvii.

LEVY enumerates 38 Mammals as indigenous to Nicaragua; "Notas sobre la Republica de Nicaragua" (Paris: 1873).

F. MARTINEZ Y SAEZ has notes on certain Mammals received from New Granada. Ann. Soc. Esp. ii. (1873) pp. 237-247

MAYNARD describes 36 species of Mammalia as still found in Florida. Bull. Ess. Inst. iv. p. 135, *et seq.* [Not seen by the Recorder; *cf.* Arch. f. Nat. 1874, ii. p. 119.]

P. PAVESI enumerates 36 species of Mammals found in the Canton Ticino; the Lynx and Ibex are extinct, but the Bear still lingers. Atti Soc. Ital. xvi. pp. 48-54.

W. PETERS identifies the Mammals collected by Rohlfs and Ascherson in the Libyan Desert, viz., 1 Bat and 6 Rodents. SB. nat. Fr. 1874, p. 66.

MONODELPHIA.

PRIMATES.

HOMINIDÆ.

CHUDZINSKI, T. Nouvelles Observations sur le Système Musculaire du Nègre. Rev. d'Anth. iii. pp. 21-41, pl. i. [cf. Zool. Rec. x. p. 6].

HAECKEL, E. Anthropogenie, oder Entwicklungsgeschichte des Menschen. Leipzig: 1874. 8vo, pp. 732, pls. i.-xii.

An elaborate attempt to trace the supposed line of descent of Man from the lower animals.

LUCAE, J. C. G. Affen- und Menschenschädel im Bau und Wachsthum Vergleichen. Frankfurt a. M.: 1873.

The skull of Man is compared with that of Apes, and the theory of his descent from the latter is opposed. [Not seen by the Recorder; cf. Arch. f. Nat. 1874, ii. p. 122.]

SIMIIDÆ.

Gorilla savagii. Note of a skull with 3 supplementary molars [cf. Zool. Rec. x. p. 7]; P. Gervais, J. Zool. iii. pp. 164-166, pl. vi. On its myology; A. Macalister, P. R. Irish Ac. (2) i. pp. 501-506, pl. xxix.

CERCOPITHECIDÆ.

Macacus brunneus is quite distinct from *M. arctoides* [cf. Zool. Rec. ix. p. 7]. J. Anderson, P. Z. S. 1874, p. 652.

Macacus rhesus and *Ateles geoffroyi*: note on their myology by H. C. Chapman, P. Ac. Philad. 1874, pp. 94 & 95, pls. xiii. & xiv.

LEMURIDÆ.

Mixocebus, g. n., W. Peters, is nearly allied to *Lepidolemur* (*Lepilemur*, Geoff.), but has two stiliform upper incisors, more projecting intermaxillaries, no interparietal, shorter ears, a longer tail, and keelless claws. Type, *M. caniceps*, sp. n.; Madagascar. MB. Ak. Berl. 1874, p. 690, 2 pls.

Menotherium, n. g. (foss.), E. D. Cope, allied to the Eocene *Tomitherium*. Type, *M. lemuringum*, sp. n.; Miocene of Colorado. P. Ac. Philad. 1873, p. 419; Bull. U. S. Geol. Surv. 1874, p. 22.

Adapis magnus, sp. n. (foss.), H. Filhol; Eocene of France. An. Soc. Geol. v. pl. viii.; J. Zool. iii. p. 465.

CHIROPTERA.

PTEROPODIDÆ.

Pteropus whitemeei, sp. n., E. R. Alston; Samoa: P. Z. S. 1874, p. 96, pl. xiv. On its habits; S. J. Whitmee, *tom. cit.* pp. 666 & 667.

VESPERTILIONIDÆ.

Vespertilio montivagus, sp. n., G. E. Dobson; Yunan. J. A. S. B. (n. s.) xliii. pt. 2, p. 237.

Scotophilus leisleri. On its distribution in Ireland; R. M. Barrington, Zool. (s.s.) 1874, pp. 4071-4074.

Nyctinomus tragatus, sp. n., G. E. Dobson, N. W. India. He reviews the other four Asiatic species: *N. rueppeli*, Swinhoe, ? = *N. cestonii*, Savi, which extends to Amoy; *N. tenuis*, Horsf., = *N. plicatus* (Buchanan). J. A. S. B. (n. s.) xliii. pt. 2, pp. 142-144.

Emballonura atrata, sp. n., W. Peters; Madagascar. MB. Ak. Berl. 1874, p. 693.

Promops bonariensis, sp. n., W. Peters; Buenos Ayres. *Tom. cit.* p. 233.

Phyllorhina swinhoei, Ptrs., = *P. armigera*, Hodg.; R. Swinhoe, P. Z. S. 1874, p. 500.

Phyllorhina brachyota, sp. n., G. E. Dobson; Central India. J. A. S. B. (n. s.) xliii. pt. 2, p. 237.

Phyllorhina masoni, sp. n., Moulmein. *Id. op. cit.* (1872) xli. pt. 2, p. 338.

Rhinolophus yunanensis, Yunan, *R. garoensis*, Assam, *R. andamanensis*, Andamans, and *R. petersi*, India, spp. nn. *Id. tom. cit.* pp. 336 & 337.

INSECTIVORA.

TUPAIDÆ.

Tupaia ellioti found in the Central Provinces of India; V. Ball, P. A. S. B. 1874, p. 95.

ERINACEIDÆ.

Hylomys. J. Anderson describes and figures in detail the dentition and osteology of *H. peguensis*, Blyth, which is perhaps the same as *H. suillus*, Müll. & Schleg. The genus appears to be more nearly allied to *Gymnura* and *Erinaceus* than to *Tupaia*. Tr. Z. S. viii. pp. 453-467, pl. liv.

SORICIDÆ.

E. BRANDT has published his important investigations as to the homologies of the teeth in this family [cf. Zool. Rec. iii. pp. 24-27]. Bull. Mosc. xlvi. pt. 2, pp. 1-79.

GENERA INCERTÆ SEDIS.

The following Miocene forms from Colorado are described by E. D. Cope, in Paleont. Bull. and Syn. Vert. Color. [cf. Rep. U. S. Geol. Surv. 1873, pp. 467-474]; but their relationships to recent families are still uncertain:—

Herpetotherium (g. n.) *tricuspis*, *H. hunti*, *H. stevensoni*, *H. fugax*, and *H. scalare*, spp. nn.

Embassia (g. n.) *alternans* and *E. marginalis*, spp. nn.

Domnina (g. n.) *gradata* and *D. gracilis*, spp. nn.

Isacis (g. n.) *caniculus*, sp. n.

CARNIVORA.

FELIDÆ.

J. E. GRAY remarks on the smaller Asiatic cats, Ann. N. H. (4) xii. pp. 52-56; gives a list of all the species, *op. cit.* xiv. pp. 351-356; and notes the colour of some kittens, pp. 377 & 378.

Felis euphilura received from Shanghai; *id. op. cit.* xiii. p. 472.

Felis scripta described and figured; A. Milne-Edwards, Rech. Mamm. pp. 341-343, pls. lvii. & lviii.

Felis tigris and *F. leopardus*. G. Busk gives measurements and "odontograms" of Chinese and Indian skulls. P. Z. S. 1874, pp. 146-150.

Felis badia, sp. n., J. E. Gray; Sarawak. *Tom. cit.* p. 322, pl. xlix.

Felis lynx. Several Lynxes have been killed in Prussia within the last few years; F. v. Droste-Hülshoff, Zool. Gart. 1874, pp. 297-299.

Pardalina warwicksi is distinct from *Felis geoffroyi* [*cf.* Zool. Rec. vii. p. 10]; the latter = *F. guigna*, Molina; J. E. Gray, Ann. N. H. (4) xiii. pp. 49-52.

Chaus caudatus, sp. n., J. E. Gray, Bokhara; probably = *F. servalina*, Severtzoff (*nec* Ogilby). *Tom. cit.* p. 188; P. Z. S. 1874, pp. 31-33, pls. vi. & vii.

Ailurogale, Fitzinger, 1869, = *Viverriceps*, Gray, 1867, = "Ailurin (Latin *Ælurina*)" Gervais, 1855; T. Gill, Ann. N. H. (4) xiii. p. 16. *Cf.* J. E. Gray, *op. cit.* xiv. p. 93.

Bunælorus lagophagus, *Daptophilus squalidens*, and *Hoplophoneus oreodontis*, gg. & spp. nn. (foss.), E. D. Cope, from Miocene of Colorado, are referred to this family, and characterized by their dentition. Syn. Vert. Color. pp. 8 & 9; Pal. Bull. No. 16; Rep. U. S. Geol. Surv. 1873, pp. 507-509.

VIVERRIDÆ.

Paradoxurus, *Paguma*, *Arctogale*, and *Nandina*. On the species of these genera; J. E. Gray, Ann. N. H. (4) xiv. pp. 242-244.

Viverra civetta and *Galera barbata*. On their myology; A. Macalister, P. R. Irish Ac. (2) i. pp. 506-513.

Herpestes ferrugineus, sp. n., W. T. Blanford; Sind. P. Z. S. 1874, p. 661, pl. lxxxii.

Herpestes persicus described; *id. tom. cit.* p. 662.

Eupleres goudoti. P. Gervais describes and figures the teeth and skeleton, and places it as a distinct tribe, *Euplerina*, among the *Viverridæ*. J. Zool. iii. pp. 237-251, pl. vii.

CANIDÆ.

Canis niger, sp. n., P. L. Sclater; Thibet. P. Z. S. 1874, p. 655, pl. lxxviii.

Canis hartshornianus, *C. lippincottianus*, *C. gregarius*, and *C. osorum*, spp. nn. (foss.), E. D. Cope; Miocene of Colorado. Syn. Vert. Color. pp. 9 & 10; Pal. Bull. No. 16, p. 3; Rep. U. S. Geol. Surv. 1873, pp. 505-507.

Vulpes. On "Chinese Fox-Myths"; T. Watters, J. N. China Soc. 1874, pp. 45-65.

Nyctereutes procynides figured; P. L. Sclater, P. Z. S. 1874, pl. l.

Tomarctus, g. n. (foss.), E. D. Cope, had only two premolars in front of the carnassial tooth. Type, *T. brevirostris*, sp. n., from Pliocene of Colorado. Pal. Bull. Nos. 14-16; Rep. U. S. Geol. Surv. 1873, p. 519.

Phenacodus, g. n. (foss.), E. D. Cope, founded on a molar tooth, is perhaps referable to this family. Type, *P. primævus*, sp. n., from Eocene of Colorado. *Tom. cit.* p. 458; Pal. Bull. No. 17, p. 3.

PROCYONIDÆ.

Cercoleptes caudivolvulus. On its habits in captivity; J. v. Fischer, Zool. Gart. 1874, pp. 300-306.

Bassaris variabilis, sp. n., W. Peters; Central America. MB. Ak. Berl. 1874, p. 704, 2 pls.

URSIDÆ.

G. BUSK, in a report on the animal remains found in Brixham Cave, gives measurements of teeth and "odontograms" of various recent and fossil Bears. Phil. Tr. clxiii. (1873) pp. 499-506.

Nearctos, Gray, 1873, = *Tremarctos*, Gervais, 1855; T. Gill, Ann. N. H. (4) xiii. pp. 15 & 16.

Æluropus melanoleucus described and figured; A. Milne-Edwards, Rech. Mamm. pp. 321-338, pls. l.-lvii.

MUSTELIDÆ.

Mustela erminea. An instance of its feigning death; M. v. Droste-Hülshoff, Zool. Gart. 1874, pp. 193 & 194.

Mustela macrura, sp. n., L. Taczanowski; Central Peru. P. Z. S. 1874, p. 311, pl. xlviii.

Putorius moupinensis, sp. n., A. Milne-Edwards; Thibet. Rech. Mamm. p. 347, pls. lix. & lx.

Putorius davidanus and *P. astutus* are also figured; *tom. cit.* pls. lix.-lxi.

Martes mustelinus, sp. n. (foss.), E. D. Cope; Pliocene of Colorado. Pal. Bull. No. 14; Rep. U. S. Geol. Surv. 1873, p. 520.

Mephites mephitica. Many instances are adduced of rabies being com-

municated to men and animals by its bite; H. C. Hovey, Am. J. Sc. (3) vii. pp. 477-483.

Arctonyx obscurus, sp. n., A. Milne-Edwards; Thibet. Rech. Mamm. p. 333, pl. lviii. & lxii.

Aonyx. On its anatomy; A. Macalister, P. R. Irish. Ac. (2) i. pp. 539-547.

Enhydra marina. On its habits and chase; C. M. Scammon, Mar. Mamm. N. Am. pp. 168-178, pl. xxii.

OTARIIDÆ.

On the skulls of the genera of this family; J. E. Gray, Ann. N. H. (4) xiv. pp. 24-30.

On the habits of the North Pacific species (*Callorhinus ursinus*, *Eumetopias stelleri*, and *Macrorhinus angustirostris*); C. Scammon, Mar. Mamm. N. Am. pp. 115-139, 141-163, pls. xx. & xxi.

Otaria jubata. J. Murie has completed his exhaustive monograph of the anatomy of the Sea-Lion. Tr. Z. S. vii. (1872) pp. 527-596, pls. lxxvii.-lxxiii.; viii. pp. 501-582, pls. lxxv.-lxxxiii. On the measurements of its blood corpuscles; G. Gulliver, P. Z. S. 1874, p. 579.

Otaria minor and *O. pygmaea*, spp. nn., J. E. Gray; habitats unknown. Ann. N. H. (4) xiii. p. 326.

Euotaria, g. n., J. E. Gray; type, *Otaria cineria*, Péron. Handl. Seals, &c., p. 34.

TRICHECIDÆ.

Trichecus rosmarus. Note on a sub-fossil skull from a quarternary deposit in France; G. A. DeFrance, Bull. Soc. Géol. (3) ii. pp. 164-170. On the measurement of its blood corpuscles; G. Gulliver, P. Z. S. 1874, p. 580. On its habits in the North Pacific; C. Scammon, Mar. Mamm. N. Am. pp. 176-181.

PHOCIDÆ.

Histiophoca equestris and *Phoca peali*. On their habits; C. M. Scammon, *tom. cit.* pp. 140, 164-167, pls. xxi. & xxii.

Phoca grælandica. A young male taken in Morcambe Bay, 23rd January, 1868, and preserved in the Kendal Museum, has been sent to Professor Turner for examination; it is the first British specimen that has been properly identified. J. Anat. Phys. ix. pp. 163-165.

Phoca gaudini, sp. n. (foss.), G. Guiscard; Miocene of Naples. Atti Acc. Nap. v. (1873), No. 6, pls. i. & ii.

Halcyon richardsi. J. E. Gray disputes J. W. Clark's identification [cf. Zool. Rec. x. p. 10] of this Seal with *P. vitulina*. Handl. Seals, &c. p. 5 (skull figured pl. ii.); Ann. N. H. (4) xiv. pp. 24-30.

GENERA INCERTÆ SEDIS.

Mesonyx, *Synoplotherium*, and *Hyænodon*, are regarded as having perhaps formed links between the fissiped and pinniped Carnivores. E. D. Cope, Rep. U. S. Geol. Surv. 1872, pp. 550-559, pls. v. & vi.

CETACEA.

BRANDT, J. F. Einige Worte über die Eintheilungen der Zahnwale.

Bull. Pétersb. xviii. (1873) pp. 575 & 576; Mém. Biol. ix. pp. 113–116.

The following arrangement of the sub-order Odontoceti is proposed:—

Tribe I. *Homæodontina* seu *Delphinomorphina*.

Family 1. *Hypognathodontidæ* (*Physeterinae*, *Ziphiinae*).

Family 2. *Holodontidæ* (*Orcinae*, *Phocæninae*, *Delphininae*, *Platanistinae*).

Tribe II. *Diaphorodontina* seu *Heterodontina*.

Family 1. *Squalodontidæ*.

Family 2. *Zeuglodontidæ*.

—. Blicke auf die Verbreitung der in Europa bisher entdeckten Zahnwale der Tertiärzeit in specieller Beziehung auf die des Wiener Beckens. SB. Ak. Wien, lxvii. (1873) pp. 117–122.

—. Ueber die bisher in Russland gefundene Reste untergegangener Cetaceen. Bull. Pétersb. xviii. pp. 141–147; Mém. Biol. ix. pp. 111 & 112.

—. Ergänzungen zu den Fossilen Cetaceen Europa's. Mém. Pétersb. (7) xxi. No. 6, pp. 54, pls. 5.

GIGLIOLI, E. H. I Cetacei osservati durante il viaggio intorno al Globo della R. pirocorvetta "Magenta" 1865–1868; colla descrizione di alcune Specei nuove o poco note, e di un nuove genere della famiglia *Balenopteridæ*. Napoli: 1874. 4to, pp. 105, pls. iii.

On the Cetaceans observed in the Atlantic, Indian, and Pacific Oceans; the new genus and species had already been indicated in the memoir next named, which has hitherto been overlooked.

—. Note intorno della Fauna Vertebrata nell' Oceano prese durante un viaggio intorno al Globo. Cetacei, pp. 71–80. Firenze: 1870, 8vo.

VAN BENEDEN, P. J. Les Baleines de la Nouvelle-Zélande. Bull. Ac. Belg. (2) xxxvii. pp. 832–837.

Critical note on some of Dr. Gray's genera. *Macleayius* = *Balæna*, and *Caperea* = *Neobalæna*.

— & GERVAIS, P. Ostéographie des Cétacés vivantes et Fossiles. Paris: text (4to) livrns. 11 & 12, Atlas (fol.) livrns. 11 & 12.

Of this work, so often mentioned, two new livraisons of the text have appeared, treating of the Cachalots and Ziphoid Whales. The two additional parts of the atlas illustrate the genera *Physeter*, *Kogia*, *Homocetus*, *Physodon*, *Palæodelphis*, *Scaldicetus*, *Hoptocetus*, *Eucetus*, *Dinoziphius*, *Hyperoodon*, *Phocæna*, and *Monodon*.

C. M. SCAMMON, in his "Marine Mammals" (*suprà*, p. 4), figures and describes from life the following North Pacific Cetaceans:—*Balæna mysticetus*, *B. sieboldi*?, *Sibbaldius sulphureus*, *Megaptera versabilis*, *Balenoptera velifera*, *B. davidsoni*, *Rhachianectes glaucus*, *Physeter macrocephalus*, *Orca rectipinna*, *O. ater*, *Phocæna vomerina*, *Grampus*

stearnsi, *Globiocephalus scammoni*, *Monodon monoceros*, *Lagenorhynchus obliquidens*, *Leucoramphus borealis*, *Tursiops gilli*, and *Delphinus bairdi*. Pp. 17-109, pls. i.-xix.

ZEUGLODONTIDÆ.

Zeuglodon vasconum, sp. n. (foss.), Delfortrie ; Upper Miocene of S. E. France. Act. Soc. L. Bord. 1873 ; J. Zool. iii. pp. 25-30.

DELPHINIDÆ.

Delphinus. The "Brown-sided Dolphin" of the North Pacific is regarded as an undescribed species, but not named ; C. M. Scammon, Mar. Mamm. N. Am. p. 106.

Delphinus cærulescens, "sp. n. ?," E. H. Giglioli ; Australian Seas. Cet. d. Magenta, p. 88.

Lagenorhynchus albirostris. On its anatomy ; J. Murie, J. L. S. xi. (1873) pp. 141-153, pl. v.

Feresa attenuata, sp. n., J. E. Gray ; habitat unknown. Ann. N. H. (4) xiv. p. 238.

Sotalia brasiliensis, sp. n. E. Van Beneden ; Bay of Rio Janeiro. J. Zool. iii. p. 297.

Grampus. Several Pacific species are regarded as perhaps distinct, but not named ; C. M. Scammon, Mar. Mamm. N. Am. pp. 103-106.

Grampus griseus. One occurred on the west coast of Holstein in February, 1873 ; K. Möbius, Zool. Gart. 1874, p. 240.

"*Beluga*, sp. n. ?." The White Whale of the North Pacific is described and figured under this heading ; C. M. Scammon, Mar. Mamm. N. Am. p. 93, pl. xviii.

PHYSETERIDÆ.

Euphysetes pottsi, sp. n., J. Haast ; New Zealand. P. Z. S. 1874, p. 260 ; Ann. N. H. (4) xiv. pp. 167 & 168.

Kogia. Dr. Gray suggests that *K. breviceps*, *K. macleayi*, and *K. floweri* may all prove identical ; op. cit. xiii. pp. 182 & 183.

BALÆNOPTERIDÆ.

Balænoptera alba, sp. n., E. H. Giglioli, Indian Ocean ; Faun. Vert. Ocean (1870), p. 74 ; = *Pterobalæna alba*, id. Cet. d. Magenta, pp. 52-59, pl. ii.

Poescopia lalandi figured ; id. tom. cit. pl. i.

Amphiptera, g. n., E. H. Giglioli, is characterized by two distinct dorsal fins, and is separated as a sub-family, *Amphipterinae*. Type, *A. pacifica*, sp. n. ; Pacific Ocean. Faun. Vert. Ocean, p. 76 ; Cet. d. Magenta, pp. 60-72, pl. iii.

Megaptera novæ-zelandiæ. A scapula, assigned to this species, described ; J. E. Gray, Ann. N. H. (4) xiii. pp. 57 & 58.

BALÆNIDÆ.

Balæna hectori, sp. n., J. E. Gray; New Zealand. *Tom. cit.* pp. 5-7.

Stenobalæna, g. n., J. E. Gray. The type is *S. xanthogaster*, sp. n., the "Sulphur-bottom" of the New Zealand Whalers. Notes and measurements by Dr. Hector are given. *Op. cit.* xiv. pp. 304 & 305.

SIRENIA.

HALITHERIIDÆ.

Halitherium canhami, sp. n. (foss.), W. H. Flower, from Red Crag of Suffolk, being the first Sirenian detected in Britain. *J. G. Soc.* xxx. pp. 1-7, pl. i.

PROBOSCIDEA.

E. D. COPE divides the Proboscidea into four sub-orders, *Elephantidæ*, *Dinotheriidæ*, *Eobasilidæ*, and *Bathmodontidæ* [*cf. Zool. Rec.* x. p. 14], and gives additional details of the last two groups. *Rep. U. S. Geol. Surv.* 1872, pp. 563-591, pls. 4.

ELEPHANTIDÆ.

Elephas. A. Leith Adams publishes his concluding report on the Maltese fossil Elephants, and recognizes as distinct species *E. mnaidriensis*, Adams, *E. melitensis*, Falc., and (more doubtfully) *E. falconeri*, Busk. *Rep. Br. Ass.* 1873, pp. 185-187 [*cf. Tr. Z. S.* viii. 1875].

Elephas indicus. M. Watson continues his memoirs on its anatomy [*cf. Zool. Rec.* x. p. 13]. Part IV. includes the muscles and blood-vessels of the face and head. *J. Anat. Phys.* ix. pp. 118-133.

Mastodon productus, sp. n. (foss.), E. D. Cope; Pliocene of New Mexico. *P. Ac. Philad.* 1874, p. 221.

Mastodon proavus, sp. n. (foss.), E. D. Cope; Pliocene of Colorado. *Syn. Vert. Color.* (1873) p. 10; *Rep. U. S. Geol. Surv.* 1872, p. 531.

UNGULATA PERISSODACTYLA.

"BRONTOTHERIDÆ."

O. C. MARSH gives further particulars as to this remarkable Miocene family [*cf. Zool. Rec.* x. p. 14]. It was truly perissodactyle, though with affinities to the *Dinocerata* and *Proboscidea*. It was most nearly allied to the *Rhinocerotidæ*, but had four sub-equal toes in the manus, and three in the pes. The nasals supported two large horn-cores placed transversely, canine teeth were present in each jaw, and the molars resembled those of *Chalicotherium*. *Symborodon*, Cope [*infra*, p. 14], = *Miobasileus*, Cope, = *Brontotherium*. Leidy's genera *Titanotherium* and *Megacerops* probably belong to this family. *Am. J. Sc.* (3) vii. pp. 81-85; *Am. Nat.* 1874, pp. 79-85, pls. i. & ii.

J. LEIDY believes that the genera *Megacerops*, *Brontotherium*, *Symborodon*, and *Miobasileus*, will all prove identical with *Titanotherium*, and that the number of species will be much reduced. P. Ac. Philad. 1874, pp. 165 & 166.

On the distinctions between *Symborodon* and *Titanotherium*; E. D. Cope, *tom. cit.* p. 224. On the characters of the former; *id.* Rep. U. S. Geol. Surv. 1873, pp. 480–485, pls. ii.–viii.

Brontotherium ingens, sp. n. (foss.), O. C. Marsh; Miocene of Colorado. Am. J. Sc. (3) vii. p. 86, pls. i. & ii.

Symborodon, g. n. (foss.), E. D. Cope. Types, *S. bucco* and *S. alterotris*, spp. nn.; Miocene of Colorado. Various species of *Megaceratops*, *Brontotherium*, and *Miobasileus*, are also referred to this genus. Pal. Bull. No. 15; Syn. Vert. Color.; Rep. U. S. Geol. Surv. 1873, pp. 480–493.

RHINOCEROTIDÆ.

Rhinoceros. On horns from Borneo, indicating the existence there of a species allied to *R. sondaicus*, but smaller; A. R. Wallace & A. Bartlett. P. Z. S. 1874, pp. 498 & 499 [*cf.* Zool. Rec. vi. p. 20].

Rhinoceros sondaicus figured; P. L. Sclater, *tom. cit.* pl. xxviii.

Rhinoceros leptorhinus. On its skull, which appears to have had a complete nasal septum; H. Woodward, Geol. Mag. (2) i. pp. 398–403, pl. xv.

Aceratherium quadriplicatum, from Miocene, and *A. megalodus*, from Pliocene of Colorado, spp. nn. (foss.), E. D. Cope. Pal. Bull. Nos. 14 & 15; Rep. U. S. Geol. Surv. 1873, pp. 495 & 520.

TAPIRIDÆ.

Tapirus bairdi extends into South Mexico; P. L. Sclater, P. Z. S. 1874, p. 89.

Rhinochærus sumatranus. On the colour of the young; J. E. Gray, Ann. N. H. (4) xiii. pp. 400 & 401.

Hyrachyus is referred to this family, and the skeleton of *H. eximius* is described; E. D. Cope, Rep. U. S. Geol. Surv. 1872, pp. 594–605.

EQUIDÆ.

O. C. MARSH reviews the American fossil forms and their descent. New genera instituted are, *Miohippus* (p. 249), Miocene, with three digits, and no anteorbital fossa; and *Pliohippus* (p. 252), Pliocene, with one digit and a large anteorbital fossa. The line of descent appears to be:—Eocene, *Miohippus*; Miocene, *Miohippus*, *Anchitherium*; Pliocene, *Anchippus*, *Hipparion*, *Protohippus*, *Pleiohippus*; Quarternary and recent, *Equus*. New species described are—*Orohippus major* (p. 248) Wyoming and Utah; *Anchitherium anceps* (p. 250), Oregon; and *A. celer* (p. 251), Nebraska; *Pliohippus pernix* (p. 252), and *P. robustus* (p. 253), Nebraska; *Protohippus avus* (p. 253), Oregon; and *Anchippus brevidens* (p. 234), Oregon. Am. J. Sc. (3) vii. pp. 247–258 [*cf.* Ann. N. H. (4) xiii. p. 397, xiv. p. 167]; Am. Nat. 1874, pp. 288–294.

P. GERVAIS discusses the typical form of the extremities, comparing the fossil and recent forms. J. Zool. iii. pp. 300-307.

Anchitherium exoletum and *A. cuneatum*, spp. nn. (foss.), E. D. Cope; Miocene of Colorado. Pal. Bull. No. 16; Rep. U. S. Geol. Surv. 1873, pp. 496 & 497.

Orotherium index, sp. n. (foss.), E. D. Cope; Eocene of Colorado. Tom. cit. p. 459.

Hippotherium paniense, sp. n. (foss.), E. D. Cope; Pliocene of Colorado. Bull. U. S. Geol. Surv. 1874, p. 12; Rep. 1873, p. 522.

Protohippus labrosus, sp. n. (foss.), E. D. Cope; Pliocene of Colorado. Tom. cit. p. 13; Rep. 1873, p. 523.

Equus burchelli. Three zebras in the Paris Jardin d'Acclimatation have been trained to harness; St. Yves Ménard, Bull. Soc. Acclim. (3) i. pp. 257-266.

GENERA INCERTE SEDIS.

Homalodontotherium (= *Homalodotherium*, Huxl.). W. H. Flower describes the only known specimen (from Patagonia), and names the species *H. cunninghami*. It appears to have connected the truly perissodactyle forms *Rhinoceros* and *Hyracodon* with the more aberrant *Nesodon* and *Toxodon*. Phil. Tr. 1874, pp. 173-182, pl. xvi.

Oltinotherium, g. n. (foss.), Delfortrie. Its affinities are doubtful, an incisor being the only part known. Type, *O. verdeani*, sp. n., Eocene of France. Act. Soc. L. Bord. xxix. pl. vii.; J. Zool. iii. p. 465.

Tillotherium latidens, sp. n. (foss.), O. C. Marsh; Miocene of Wyoming. Am. J. Sc. (3) vii. p. 533.

UNGULATA ARTIODACTYLA.

HIPPOPOTAMIDÆ.

Hippopotamus amphibius. Measurements of the blood corpuscles; G. Gulliver, P. Z. S. 1874, p. 579.

Cheropsis liberiensis. On the visceral anatomy and myology of a young female which died in the Dublin Zoological Society; A. Macalister, P. R. Irish Ac. (2) i. pp. 494-500, pl. xxviii.

SUIDÆ.

Sus moupinensis, described and figured; A. Milne-Edwards, Rech. Mamm. pp. 377-379, pls. lxxx. & lxxxi.

Elotherium ramosum, sp. n. (foss.), E. D. Cope; Miocene of Colorado. Bull. U. S. Geol. Surv. 1874, p. 27; Am. Nat. vii. p. 437.

Elotherium bathrodon, sp. n. (foss.) O. C. Marsh; Miocene of Dakota. Am. J. Sc. (3) vii. p. 534.

Pelonax, g. n. (foss.), E. D. Cope. Allied to *Elotherium*, but with four digits on each foot, and a rudimentary fifth on the pes. Types, *Elotherium crassum*, Marsh, and *E. ramosum*, Cope. Rep. U. S. Geol. Surv. 1873, p. 504.

HYOPOTAMIDÆ.

W. KOWALEVSKY describes in detail the osteology of the Miocene forms of this family; his present paper treating principally of the limb bones. Phil. Tr. 1873, pp. 19-94, pls. xxxv.-xl.

Dipopus, g. n. (foss.), Kowalevsky, allied to *Hyopotamus*, but didactyle. Type, *D. aymardi*, sp. n.; Eocene of England. *Tom. cit.* p. 30.

TRAGULIDÆ.

Hyipsisodus, g. n. (foss.), E. D. Cope, allied to, the next genus and to *Leptomeryx*. Type, *H. minimus*, sp. n.; Miocene of Colorado. P. Ac. Philad. 1873, p. 419.

Hypertragulus, g. n. (foss.), Cope. Types, *H. calcaratus* and *H. tricosatus*, spp. nn.; Miocene of Colorado. *Tom. cit.* p. 419; Bull. U. S. Geol. Surv. 1874, p. 27.

Stibarus, g. n. (foss.), E. D. Cope. Probably allied to the above. Type, *S. obtusilobus*, sp. n.; Miocene of Colorado. Pal. Bull. No. 16; Rep. U. S. Geol. Surv. 1873, p. 503.

Tragulohyus, g. n. (foss.), P. Gervais, with a continuous series of grinding teeth, of which the molars resemble those of *Xiphodon* and the pre-molars those of *Anthracootherium*. Type, *T. inermis*, sp. n.; phosphate chalk of Quercy — the only part known is a mandible. J. Zool. iii. pp. 286 & 287.

CERVIDÆ.

J. D. CATON writes on the structure and casting of the antlers of Deer. Am. Nat. vii. pp. 348-353.

L. J. FITZINGER has begun a voluminous review of the Deer in a style similar to his former revisions of other families [cf. Zool. Rec. iv. p. 28]. He divides them into 16 genera, of which 4, *Strongyloceros*, *Doryceros*, *Elaphoceros*, and *Nanelephus* appear to be new. The names *Macrotis* and *Furcifer* are suppressed, having already been used in Chiroptera and Reptilia, and *Otelaphus* and *Creagroceros* are proposed as substitutes. SB. Ak. Wien, lxviii. pp. 332-362, lxix. pp. 519-604, lxx. pp. 239-333.

Alces malchis. On the date of its extinction in Silesia; Dr. Göppert, JB. schles. Ges. 1873, p. 47; W. Stricker, Zool. Gart. 1874, p. 196.

Cervus dama. L. H. Jeitteles points out that instead of having been introduced from the Mediterranean countries, the Fallow-Deer was spread in pre-historic ages as far north as Denmark and England; *ibid.* pp. 288-297. P. L. Sclater translates his articles with notes; Nature, xi. pp. 71-74. and W. Boyd Dawkins dissents from his conclusions, *tom. cit.* pp. 112 & 113 [cf. *tom. cit.* pp. 210 & 226 (1875)]. A doe with double hind-feet dropped fawns similarly deformed for several successive years; E. Ward, P. Z. S. 1874, p. 90.

Cervus caspicus, sp. n., V. Brooke, is a provisional name for a Rusine Deer from Persia; the horns are figured. *Tom. cit.* p. 42.

Cervus euopsis, sp. n., Swinhoe, is adopted as a provisional name for a Deer from North China, allied to *C. sika*; P. L. Sclater. *Tom. cit.* p. 151.

Cervus latifrons, sp. n. (foss.), R. Johnson, from forest-bed of Norfolk. Ann. N. H. (4) xiii. p. 1.

Cervulus. Sir V. Brooke considers this genus to be more specialized than the rest of the family, as shown both in the union of the tarsal bones and the reduction of the second and fifth digits. He reviews the species, and figures *C. sclateri*, Swinhoe, which perhaps = *C. lachrymans*, Milne-Edwards. P. Z. S. 1874, pp. 33-42, pls. viii. & ix.

Cervulus lachrymans described and figured; A. Milne-Edwards, Rech. Mamm. pp. 348-353, pls. lxiii. & lxiv.

Elaphodus cephalopus described and figured; *id.*, *tom. cit.* pp. 353 & 356, pls. lxv.-lxvii.

Lophotragus, g. n., R. Swinhoe. Type, *L. michianus*, sp. n., a small Deer without horns, but with a tuft of hair in their place, from near Ningpo. The skull is unknown. P. Z. S. 1874, p. 453, pl. lix.

Xenelaphus, *Furcifer*, and *Coassus*. Notes on the species of these genera; J. E. Gray, Ann. N. H. (4) xiii. pp. 331 & 332.

BOVIDÆ.

Oryx beatrix. Its Arabian habitat confirmed; O. B. C. St. John, P. Z. S. 1874, p. 95.

Gazella muscatensis, sp. n., V. Brooke; Muscat. *Tom. cit.* p. 142, pl. xxii.

Antelope (Nemorhedus) cinerea, sp. n., A. Milne-Edwards; Thibet. Rech. Mamm. p. 362, pls. lxx. & lxx. A. *A. grisea* and *A. edwardsi* are also figured, *tom. cit.* pls. lxxi.-lxxiii.

Antelope saiga. On the structure of its nose; L. Glitsch, Verh. L.-C. Ak. xxxvi. art. i. pp. 21, pls. iii.

Capra ægagrus. The Cretan Ibex identified with this species; P. L. Sclater, P. Z. S. 1874, pp. 89 & 90. On the introduction of the Angora variety into Australia; S. Wilson, P. Zool. Soc. Vict. ii. (1873) pp. 159-204.

Ovis brookii, sp. n., E. Ward; Ladak. P. Z. S. 1874, p. 143, skull and horns figured.

Ovis poli figured and described; F. Stolickza, *tom. cit.* pp. 425-427, pl. liii.

Ovis nahoar figured and described; A. Milne-Edwards, Rech. Mamm. pp. 357-360, pls. lxviii. & lxix.

Ovibos moschatus, found in the diluvium of Silesia; F. Roemer, Z. geol. Ges. xxvi. pp. 600-604.

Bos. E. L. Sturtevant discusses the history of "The Wild Cattle of Scotland, or White Forest Breed," which he regards as the descendants. with now and then a bar sinister, of the ancient native race [*cf.* Zool. Rec. x. p. 16]. Am. Nat. viii. pp. 135-145.

Bos primigenius. J. Carter describes a skull found in the Cambridge-shire Fens which has a neolithic flint celt wedged into its fractured frontal bone; it is now in the Woodwardian Museum, Cambridge. Geol. Mag. (2) i. pp. 492-496.

1874. [VOL. XI.]

Budorcas taxicolor, var. *tibetana*, described and figured; A. Milne-Edwards, Rech. Mamm. pp. 367-377, pls. lxxiv.-lxxix.

Bison europæus. On this species and *Bos primigenius* in historic times; F. W. Mäklin, Öfv. Fin. Soc. xiv. (1872) pp. 93-105.

Bubulus pumilus. On its identification [*cf.* Zool. Rec. x. p. 16]; V. Brooke, Ann. N. H. (4) xiii. pp. 156-160; and J. E. Gray, *tom. cit.* pp. 258 & 259.

CAMELIDÆ.

Procamelus heterodontus, sp. n. (foss.), E. D. Cope; Pliocene of Colorado. P. Ac. Philad. 1873, p. 420; Bull. U. S. Geol. Surv. 1874, p. 20.

Protocamelus virginianensis, sp. n. (foss.), J. Leidy; Miocene of Virginia. P. Ac. Philad. 1873, p. 15.

Merycodus gemmifer, sp. n. (foss.), E. D. Cope; Pliocene of Colorado. Bull. U. S. Geol. Surv. 1874, p. 22.

HYRACES.

Dendrohyrax bakeri, sp. n., J. E. Gray, North-east Africa. Ann. N. H. (4) xiv. p. 133.

GLIRES.

Sciurus vulgaris. On its nesting habits; R. Meyer, Zool. Gart. 1874, pp. 457-459.

Sciurus calliurus, sp. n., Buchholtz (W. Peters); West Africa. MB. Ak. Berl. 1874, p. 707.

Sciurus relictus, sp. n. (foss.), E. D. Cope; Miocene of Colorado. Syn. Vert. Color. p. 3; Rep. U. S. Geol. Surv. 1873, p. 475.

Arctomys robustus described and figured; A. Milne-Edwards, Rech. Mamm. pp. 309-314, pls. xlvii. & xlix.

Gymnotychus, g. n. (foss.), E. D. Cope, allied to the Squirrels, but differing in dentition. Types, *G. trilophus* and *G. minutus*, spp. nn.; Miocene of Colorado. Pal. Bull. No. 16, p. 6; Rep. U. S. Geol. Surv. 1873, p. 476.

Steneofiber pansus, sp. n. (foss.), E. D. Cope; Pliocene of New Mexico. P. Ac. Philad. 1874, p. 222.

Castor canadensis. On its habits; F. R. Brunot, Rep. Sm. Inst. 1873, pp. 422 & 423.

E. COUES, in his "Synopsis of the Muridæ of North America," gives an abstract of an exhaustive memoir which he is preparing. He considerably reduces the number of recorded species, and proposes some new divisions [*infra*]. *Tom. cit.* pp. 173-196; also separately with additions, Philadelphia: 1874, 8vo, pp. 28.

Mus rattus. Specimen with malformed incisors described; F. H. Balkwill, Zool. (s.s.) 1874, pp. 3935 & 3936.

Hesperomys. E. Coues recognizes the sub-genera *Onychomys* and *Oryzomys*, Bd., and adds a third, *Vesperimus*, sub-g. nov.; type, *H. leucopus* (Raf.). P. Ac. Philad. 1874, p. 178.

Reithrodon, Baird (nec Waterhouse), is re-named *Ochetodon*; type, *R. humilis* (Aud. & Bachm.). *Id.*, tom. cit. p. 184.

Reithrodon. E. Coues makes two sub-genera, *Reithrodon* proper, type, *R. cuniculoides*, Waterh., and *Euneomys*, sub-g. n., type, *R. chinchilloides* (Waterh.). *Tom. cit.* p. 185 (footnote).

The name *Lophuromys* is proposed for *Lasiomys*, Ptrs. [cf. Zool. Rec. iii. p. 33], which is pre-occupied. W. Peters, MB. Ak. Berl. 1874, p. 234.

Arvicolinæ. H. P. Blackmore and E. R. Alston review the fossil remains referable to this sub-family, recognizing seven species of *Arvicola*, and two of *Myodes*. P. Z. S. 1874, pp. 460-471.

Hypudæus, Keys. & Blas. (nec Illiger), is re-named *Evotomys*; type, *Mus rutilus*, Pall. E. Coues, P. Ac. Philad. 1874, p. 186.

Synaptomys, proposed by Baird as a sub-generic name for *Myodes cooperi*, is adopted by E. Coues as a full genus. *Tom. cit.* p. 192.

Heteromys, Desm. (1820), = *Sacomys*, F. Cuv. (1823). *H. adspersus*, sp. n., W. Peters; Panama. MB. Ak. Berl. 1874, p. 357.

Dasyprocta antillensis, sp. n., P. L. Sclater; West Indian Islands. P. Z. S. 1874, p. 666, pl. lxxxii.

Lepus dayanus, sp. n., W. T. Blanford; Sind. *Tom. cit.* p. 663.

Lepus europæus and *L. cuniculus*. On their supposed interbreeding; Beling, Zool. Gart. 1874, pp. 74-76.

Paleolagus agapetillus, *P. turgidus*, and *P. triplex*, spp. nn., E. D. Cope; Miocene of Colorado. Pal. Bull. Nos. 15 & 16; Rep. U. S. Geol. Surv. 1873, pp. 477-479.

Lagomys tibetanus described and figured; A. Milne-Edwards, Rech. Mamm. pp. 314-321, pls. xlviii. & xlix.

GENERA INCERTÆ SEDIS.

Heliscomys, g. n. (foss.), E. D. Cope, with four lower molars resembling those of some of the *Muridæ*. Type, *H. vetus*, sp. n., from Miocene of Colorado. Syn. Vert. Color. p. 3; Rep. U. S. Geol. Surv. 1873, p. 475.

Colotaxis, g. n. (foss.), E. D. Cope, Pal. Bull. No. 15, = *Ischyromys*, Leidy. *Tom. cit.* p. 477.

EDENTATA.

W. TURNER'S "general observations" on the placentation of this order are reproduced from Tr. R. Soc. Edinb. [cf. Zool. Rec. x. p. 19]. J. Anat. Phys. viii. pp. 362-376.

Bradypus. On the myology of the genus; H. W. Macintosh, P. R. Irish Ac. (2) i. pp. 517-529.

Bradypus didactylus. Note on the rete mirabile of its arteries; H. C. Chapman, P. Ac. Philad. 1874, p. 95, pl. xiii.

Lestodon ? *trigonidens*, sp. n. (foss.), P. Gervais; Argentine Republic. Mém. Soc. Géol. (2) ix. (1873), No. v.; J. Zool. iii. p. 161, pl. v.

Morotherium, g. n. (foss.), O. C. Marsh, is allied to *Megalonyx* and

Myiodon, but the humerus had no supra-condylar foramen, and the femur no depression for the round ligament. Types, *M. gigas*, sp. n.; Pliocene of California, and *M. leptonyx*, sp. n.; Pliocene of Idaho. Am. J. Sc. (3) vii. pp. 531 & 532.

Tatusia peba. On the existence of an enamel organ in the dental germ; C. S. Tomes, Q. J. Micr. Sci. xiv. pp. 44-48.

Muletia, g. n., J. E. Gray, separated from *Tatusia*, the type being *T. sextemcincta*. Skull and sacral and caudal vertebræ figured. P. Z. S. 1874, pp. 244-246, pl. xli.

Tolyteutes conurus. J. Murie gives a detailed account of its myology and visceral anatomy, and compares the skeleton with that of the Glyptodons. Tr. L. S. xxx. pp. 71-132, pls. xx.-xxvi.

Myrmecophaga jubata. G. Pouchet has published an elaborate monograph of its anatomy, "Mémoires sur le Grand Fourmilier." Paris: 1874, 4to, pp. 218, pls. xviii.

GENERA INCERTÆ SEDIS.

Valgipes, g. n. (foss.), P. Gervais, type, *V. deformis*, sp. n.; bone-caves of Brazil. The only known part is the calcaneum. Mém. Soc. Géol. (2) ix. (1873) No. v.; J. Zool. iii. p. 162, pl. v.

Stylinodon, g. n. (foss.), O. C. Marsh, is doubtfully referred to this order; it has also some resemblances to *Toxodon*. Type, *S. mirus*, sp. n.; Eocene of Wyoming. Am. J. Sci. (3) vii. p. 532.

DIDELPHIA.

MARSUPIALIA.

R. OWEN, in parts viii. and ix. of his memoirs "On the Fossil Mammals of Australia" [cf. Zool. Rec. x. p. 20] describes *Protemnodon* (p. 274), *Pachysiagon* (p. 784), *Leptosiagon* (p. 785), *Procoptodon* (p. 786), and *Palorchestes*, gg. nn. (foss.). Also *Osphranter cooperi* (p. 261), *O. gouldi* (ib.), *Phascolagus altus* (ib.), *Sthenurus brehus* (p. 272), *Protemnodon* og (p. 277), *P. mimas* (p. 278), *P. reclus* (p. 281), *Macropus ferragus* (p. 784), *Leptosiagon gracilis* (p. 785), *Pachysiagon otuel* (p. 784), *Procoptodon pusio* (p. 788), *P. rapha* (ib.) and *Palorchestes azael* (p. 798), spp. nn. (foss.). Phil. Tr. clxiv. pp. 245-287, 783-803, pls. xx.-xxvii. lxxvii.-lxxxiii.

Halmaturus luctuosus, sp. n., L. M. d'Albertis; New Guinea. P. Z. S. 1874, p. 110. Figured; P. L. Sclater, tom. cit. pl. xlii. [cf. op. cit. 1875, pp. 48-59].

Halmaturus apicalis, sp. n., A. Günther; N. W. Australia. Op. cit. 1874, p. 653, pl. lxxvii.

R. OWEN, in part iv. of his memoirs "On the Osteology of the Marsupialia" [cf. Zool. Rec. x. p. 20] describes and figures the bones of the trunk and limbs of *Phascolomys combattus*, *platyrhinus*, and *latifrons*. Tr. Z. S. viii. pp. 483-500, pls. lxix.-lxxiv.

A V E S.

BY

R. BOWDLER SHARPE, F.L.S., F.Z.S., &c.,

AND

JAMES MURIE, M.D., F.L.S., &c.

THE striking discoveries for the year 1874 are limited in number; but some remarkable books have nevertheless been produced during its course, the chief of which must be reckoned the great works on North American birds, by Messrs. Baird, Brewer, Coues, and Ridgway. The Malay Archipelago (especially Borneo) has received much elucidation with respect to its ornithology at the hands of Count Salvadori, while the ornithological discoveries by Dr. Meyer and Signor D'Albertis in New Guinea are enough to make the ornithological discoveries of 1874 more than usually noteworthy. Herr Fritsch's tables on the migration of birds in various parts of Europe, based as they are on observations extending over many years, cannot fail to throw much light upon this important phenomenon. The three principal ornithological journals exhibit their customary activity, and altogether in every branch of the science, steady progress has to be recorded. In anatomy, Mr. Garrod's papers, and especially those on the value of the muscles in classification, deserve prominent notice. Fossil ornithology has received great attention from M. Alphonse Milne-Edwards, Dr. Hector, and Dr. Haast; whilst Professor Owen's description of a new dentigerous bird is one of the most interesting features in the history of the year.

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BOCAGE, J. V. BARBOZA DU. Die Glanzstaare Afrika's monographisch bearbeitet von Dr. G. Hartlaub. J. Sc. Lisb. 1874, pp. 61-64. [*Sturnidae*.]

FINSCH, O. Literarischer Bericht. J. f. O. 1874, pp. 76-80.

Reviews Baird, Brewer, and Ridgway's work on North American birds.

HUME, A. O. Die Papageien. Str. Feath. ii, pp. 1-28.

A review of the genus *Palæornis* as put forward in Dr. Finsch's great Monograph of the Parrots [Zool. Rec. iv. p. 83]. Certain of the criticisms are uncalled for, and unduly severe upon the last-named author, whose work was well done up to the date of publication, and who cannot be

blamed for not knowing facts published for the first time by Mr. Hume in this present paper. [See also WALDEN, Viscount.]

——. Messrs. Slater and Finsch's Index to the Ornithological Literature of 1872. *Tom. cit.* pp. 451–453.

Corrects a few errors in the list with regard to the author's papers (*cf.* Slater, *Ibis*, 1874, pp. 185, 188).

PELZELN, A. VON. Bericht über die Leistungen in der Naturgeschichte der Vögel während des Jahres 1873. *Arch. f. Nat.* 1874 (2), pp. 1–106.

By far the most exhaustive Record ever yet compiled.

SLATER, P. L. Dr. A. B. Meyer's Ornithological Discoveries in New Guinea. *Ibis*, 1874, pp. 416–420. [See "AUSTRALIAN REGION."]

——. New and forthcoming Bird-books. *Tom. cit.* pp. 172–181.

A review of recent ornithological works.

WALDEN [ARTHUR HAY], Viscount. A Reply to Mr. Allan Hume's Review of "Die Papageien" of Dr. Otto Finsch. *Tom. cit.* pp. 270–299.

Shows the injustice of most of the reviewer's charges against Dr. Finsch.

THE GENERAL SUBJECT.

COUES, E. Field Ornithology. Salem, Mass.: 1874. 8vo.

Contains instructions for collectors both in the field and at home, to which is added a "Check List" of the birds of North America, 635 in number.

DRESSER, H. E., & BLANFORD, W. F. Notes on the specimens in the Berlin Museum, collected by Hemprich and Ehrenberg. *Ibis*, 1874, pp. 335–343.

A paper of vast importance to the student of Palearctic Ornithology. The identifications are too numerous to be given in detail, the greater number referring to the family *Sylviidae*.

ELLIOT, D. G. [See WOLF, J.]

FRITSCH, K. Normale Zeiten für den Zug der Vögel und verwandte Erscheinungen. *Denk. Ak. Wien*, xxxiii. pp. 199–258.

Incorporates the observations of 13 or 14 years (1854–68). The author's official position has enabled him to collect an immense amount of data, which have been worked up most satisfactorily. The more important results as to dates, places, &c., are epitomized in tables, thus facilitating a comprehension of the elaborate problem as to the laws of migration, &c., in birds. The numbers of the various groups of birds, and the great areal range through which these observations extend, enhance the value of this able communication. Side by side,—seasons, times, and localities being accurately noted,—the Avifauna of Austria (proper), Bohemia, Hungary, Galizia, Tirol, Belgium, and Norway, are compared. The author's special object is to register and elucidate:—1, the arrival and departure of the birds of passage; 2, the appearance

and disappearance of occasional residents; and 3, the periods when their broods are full fledged.

GARROD, A. H. On certain muscles of Birds and their value in classification. Part II. P. Z. S. 1874, pp. 111-123, pl. xvii.

HUDSON, W. H. Notes on the procreant instincts of the three species of *Molothrus* found in Buenos Ayres. *Tom. cit.* pp. 153-174.

HUME, A. O. The Indian ornithological collector's Vade Mecum: containing brief practical instructions for collecting, preserving, packing, and keeping specimens of Birds, Eggs, Nests, Feathers, and Skeletons. Calcutta: 1874, 12mo, pp. 1-78.

MACLAGAN, D. Note on Grouse Disease. P. R. S. Edinb. 1873-74, viii. p. 378.

In one bird examined, 4800 *Strongyli* were estimated as the number of parasites present.

MILNE-EDWARDS, A. Recherches sur la Faune Ancienne des Îles Mascareignes. Ann. Sc. Nat. (5) xix. pp. 1-31, pls. xi.-xv.

The ancient fauna of Rodriguez and Bourbon appears to afford evidence of a once more or less united land area in the south-westerly part of the Indian Ocean, and some such idea alone can afford an explanation of the apparently isolated character of certain species in these and neighbouring islands, or yield a clue to relationships with forms presumably allied to those of Madagascar, Africa, and possibly India and Australia. Thus Darwin's hypothetical South Indian continental area, of which the coral reefs, atolls, and submerged banks are the remnants, receives a certain amount of corroboration. The remarkable fact is the meagre and changed avifauna of to-day as compared with Leguat's account (1708); the caverns and debris revealing disappeared types, and otherwise substantiating the veracity of the old traveller's description. Skeletal segments of the following new genera and species from the island of Rodriguez are described and figured:—*Erythromachus leguati*, *Ardea megacephala*, *Strix (Athene) murivora*, *Strix* sp. ?, *Columba rodericana*, *Necropsittacus rodericanus*; and from the Mauritius fragments, *Astur* sp. n. ?, *Phœnicopterus* sp. incert. *Turtur picturatus*, *Palæornis exsul*, and *Psittacus mauritianus* are further commented on, with fresh illustrations.

— Observations sur les oiseaux fossiles des faluns de Saucats et de la molasse de Léognan. Bibl. de l'École H. Études, xi. art. v.

Two fossil species of *Procellariidæ* [q. v.], and a Gannet [*Pelecanidæ*], are described.

SALVADORI, T. Note ornithologische. I. Atti Acc. Tor. ix. pp. 633-635.

Observations on *Dasyptilus pecqueti*, *Rhodonessa caryophyllacea*, and *Dasyrhamphus herculis* [Zool. Rec. vii. p. 64].

SALVIN, O. A visit to the principal museums of the United States, with notes on some of the Birds contained therein. Ibis, 1874, pp. 305-329, pls. xi. & xii.

The Smithsonian Institution, the museums of New York, Philadelphia, Boston, Vassar College, and the private collections of Mr. Lawrence, Dr.

Cabot, and Dr. Merritt, were all examined by the author, who has made a most interesting determination of the types they contain. Two species are described as new [*Cracida*, *Columbida*].

SEELEY, H. G. Resemblances between the Bones of Typical Living Reptiles, and the Bones of other Animals. J. L. S. xii. pp. 155-195.

Whilst essentially dealing with the similitudes and transcendental phases of the Reptilian skeleton, the author discusses in three chapters the avian characters of Crocodiles, Chelonians, and Lizards. A comparison of the positive and negative skeletal characters is instituted.

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WALLACE, A. R. On the arrangement of the families constituting the order Passeres. Ibis, 1875, pp. 406-416.

The author divides the Passerine Birds into four main groups or "series," the basis of the arrangement being the first primary quill.

WOLF, JOSEPH. The life and habits of Wild Animals. With descriptive letterpress by D. G. Elliot. London: 1874. Imp. 4to.

Contains several excellent illustrations of birds.

PALÆARCTIC REGION.

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48 species were observed, with good field observations.

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266 species included as belonging to the two counties, one of which, *Merops philippensis*, is an addition to the British list. The notes on nearly all are of the greatest value, especially the observations on certain changes of plumage.

HAUSMANN, A. Notizen über einige Vögel Pommerns. J. f. O. 1874, pp. 388-391.

Brachyotus palustris, *Strigiceps cineraceus*, *Cyanecula cærulecula*, *Pica caudata*, and *Carpodacus erythrinus* in Pomerania.

HEUGLIN, T. VON. Reisen nach dem Nordpolarmeer in den Jahren 1870 und 1871 (Braunschweig : 1874, 8vo), iii. Zoologie, pt. 2, Vögel, pp. 79–201.

Enumerates 50 species from Spitzbergen and Nova Zembla, with synonymy, observations on different phases of plumage and habits, &c. Unknown species of *Lagopus* (p. 104) and *Larus* (p. 187) are referred to, and the differences between *Cepphus mandti* and *C. grylle* pointed out, a mid-wing feather of each being figured (p. 162).

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184 species mentioned.

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QUÉPART, N. Ornithologie Parisienne, ou Catalogue des oiseaux sédentaires et de passage qui vivent à l'état sauvage dans l'enceinte de la ville de Paris. Paris : 1874, 12mo.

53 species are recorded.

BODD, E. H. Note on the Ornithology of Cornwall for 1873–4. J. Inst. Cornw., No. xvi. Oct. 1874, p. 58.

SAXBY, H. L. The Birds of Shetland, with observations on their habits, migration, and occasional appearance. Edited by S. H. SAXBY. Edinburgh : 1874. 8vo, pp. 1–398.

301 species included, but at least 6 of them very doubtful. The long residence of the author in Shetland gives his observations much value, and it must be regretted that he did not live to publish his work.

- SEVERTZOW, N. Allgemeine Uebersicht der Aralo-tianschanischen Ornith, in ihrer horizontalen und verticalen Verbreitung. J. f. O. 1874, pp. 402-447. [Zool. Rec. x. p. 28.]
- . [New pheasants from West Asia]. Bull. Mosc. xviii. pt. 2, pp. 207-210 [*Phasianidæ*].
- . [See BOGDANOW.]
- STEVENSON, H. Ornithological Notes. Tr. Norw. Soc. 1873-4, pp. 81-85.
- SUNDEVALL, C. J. Spetsbergens Foglar med Hufvudsakligt avseende på dem som blivt funna under Prof. Nordenskiölds resor dit åren 1868, och 1872-1873. Öfv. Ak. Förh. 1874, pp. 11-25.
- After some general remarks on the Avifauna, the author gives notes on 30 species of birds.
- TACZANOWSKI, L. Zweiter Nachtrag zum Bericht ueber die Ornithologischen Untersuchungen des Dr. Dybowski in Ost-Sibirien. J. f. O. 1874, pp. 315-337.
- Gives the result of Dr. Dybowski's labours during the year 1873, on the Argun River in Eastern Siberia. Several species are new [*Sylviidæ*, *Fringillidæ*, *Emberizidæ*, *Laniidæ*, *Otididæ*].
- TSCHUSI-SCHMIDTHOFEN, V. VON. Ornithologische Mittheilungen aus Oesterreich. *Tom. cit.* pp. 340-343.
- WRIGHT, C. A. Fifth appendix to a list of Birds observed in Malta and Gozo. Ibis, 1874, pp. 223-241.
- 10 species added to the Maltese Avifauna, and one, *Saxicola leucopyga*, to that of Europe, with notes as to the birds recorded in the author's former papers [Zool. Rec. vii. p. 26].
- YARRELL, W. [See NEWTON, A.]

ETHIOPIAN REGION.

- AYRES, T. Additional list of and notes on Birds obtained in the Republic of Trans-Vaal. Ibis, 1874, pp. 101-107, pl. iii.
- 26 species added (Zool. Rec. x. p. 29).
- BOCAGE, J. V. BARBOZA DU. Aves das possessões Portuguezas da Africa occidental. Nona Lista. J. Sc. Lisb. 1874, pp. 32-46.
- 58 species from the Cunene River, one new [*Muscicapidæ*].
- . Decima Lista. *Tom. cit.* pp. 47-60.
- 79 species, from the same locality, are mentioned, one being new [*Motacillidæ*].
- BUCKLEY, T. E. List of Birds collected or observed during a journey into the Matabili country in 1873. Ibis, 1874, pp. 355-391.
- Notes on the 175 species met with by the author, with records of their soft parts, etc., so that the paper forms a valuable addition to the Avifauna of South Africa.
- HARTLAUB, G. Die Glanzstaare Afrika's monographisch bearbeitet. Abh. Ver. Brem. iv. pp. 35-98. [*Sturnidæ*.]

HEUGLIN, T. N. A Handbook to the Birds of Egypt, by G. E. Shelley. J. f. O. 1874, pp. 46-54.

A running commentary, with notes on Captain Shelley's book [Zool. Rec. ix. p. 27].

MILNE-EDWARDS, A. Observations sur l'existence de certains rapports entre le mode de coloration des oiseaux et leur distribution géographique. C. R. lxxvii. p. 1551.

Melanism is shown to be a peculiarity, or in the majority of cases an attribute, of the Southern Avifauna; and from this and other facts connected therewith, a former different land and water distribution of the Southern Hemisphere is premised.

REICHENOW, A. Zur Vogelfauna Westafrika's. Ergebnisse einer Reise nach Guinea. J. f. O. 1874, pp. 353-388.

The first part of an account of the author's expedition to the Gold Coast and Cameroons. The notes refer to about 50 species of *Anseres*, *Grallæ*, *Gallinæ*, *Accipitres*, and *Columbæ*.

— Bericht über die ornithologischen Sammlungen der Expedition nach Westafrika. Correspondenzblatt der Afrikanischen Gesellschaft (Berlin), 1874, No. 10, pp. 176-187.

90 species as yet received from the German expedition to the Loango Coast are here discussed; observations by Dr. Falkenstein being in many cases added. One new species is described [*Turdidæ*].

SHARPE, R. B. On a small collection of Birds from Bulama, one of the Bissagos Islands, W. Africa. P. Z. S. 1874, pp. 305 & 306.

19 species noticed.

— A Study of the Larks of South Africa. *Tom. cit.* pp. 614-651, pls. lxxv. & lxxvi. [*Alaudidæ*.]

USSHER, H. T. Notes on the Ornithology of the Gold Coast. *Ibis*, 1874, pp. 43-75, pl. ii.

Gives the result of 15 years' experience of West African birds, no less than 170 species being noticed.

INDIAN REGION.

ADAM, R. M. Additional Note on the Birds of the Sambhur Lake and its vicinity. *Str. Feath.* ii. pp. 337-341.

Adds 10 species to the former list (*Zool. Rec.* x. p. 30), and gives notes on some previously mentioned.

ANDERSON, A. On the Nidification of certain Indian Birds. Part iii. *Ibis*, 1874, pp. 220-223. [*Anatidæ*.]

BALL, V. Letter from. *Str. Feath.* ii. p. 333.

Refers to *Micronisus soloensis* and *Ninox hirsuta* from the Nicobars, in the Vienna Museum.

— On the Avifauna of the Chutia (Chota) Nagpur Division, S. W. frontier of Bengal. *Tom. cit.* pp. 355-440.

A most valuable paper. 294 species included, 10 being added by Mr. Brooks.

BLANFORD, W. T. Notes on the synonymy of some Indian and Persian Birds, with descriptions of two new species from Persia. *Ibis*, 1874, pp. 75-81. [*Turdidæ*, *Sylviidæ*.]

— Letter from. *Tom. cit.* pp. 91 & 92.

Refers to Major Lloyd's paper [*Zool. Rec.* x. p. 33].

DAVID, A. Description de quelques Oiseaux de Chine. *C. R.* lxxviii. pp. 540 & 541.

A mere list of names of species, said to be descriptions of specimens from Western China, but without localities or date. The genera and species indicated seriatim are: *Ithaginis sinensis*, *Pomatorhinus gravivox*, *Carpodacus lepidus*, *Suthora cyanophrys*, *Psaltia sophia*, *Trocalopteron milnii*, *Heteromorpha fokienensis*, *Parus (Machlolophus) rez*, *Isulus superciliaris*, *Alcippe hueti*, and *Pomatorhinus swinhoii*.

GODWIN-AUSTEN, H. H. Fourth list of Birds, principally from the Nágá Hills and Muni-púr, including others from the Khasi, Garo, and Tipperah Hills. *J. A. S. B.* (n.s.) xliii. part ii. pp. 151-180, pls. iv.-x.

Adds 112 species to the previous list (*Zool. Rec.* ix. p. 29).

— Descriptions of 10 new Birds from the Nágá Hills and Muni-púr Valley, North East Frontier of Bengal. *P. Z. S.* 1874, pp. 43-48, pls. x.-xii. [*Sittidæ*, *Turdidæ*, *Sylviidæ*, *Fringillidæ*.]

GOULD, J. The Birds of Asia. Part xxvi. London: 1875.

All species figured are noticed under their respective families.

HEUGLIN, T. VON. Verzeichniss der in China beobachteten Vögel nach R. Swinhoe. *J. f. O.* 1874, pp. 393-402.

A list of European Birds, 168 in number, found in China, extracted from Mr. Swinhoe's paper (*Zool. Rec.* viii. p. 40).

HUME, A. O. Contributions to the Ornithology of India. The Islands of the Bay of Bengal. *Str. Feath.* ii. pp. 29-324.

Gives a very complete account of the Andaman and Nicobar islands, divided into:—I. "Physical aspects." II. "Diary of our trip." III. "Analysis of the Avifauna." IV. "Detailed list of species." 167 species were definitely determined and 6 not so accurately, bringing the Avifauna of the islands up to 173 species. [*Meropidæ*, *Alcedinidæ*, *Turdidæ*, *Scolopacidæ*, *Laridæ*.]

— Additional notes on the Avifauna of the Andaman Islands. *Tom. cit.* pp. 490-501.

Four species added to the above-mentioned list, and many notes given on interesting species.

— A first list of the Birds of the Tenasserim Provinces. *Tom. cit.* pp. 467-484.

431 species included, 3 being probably new [*Nectariniidæ*, *Sturnidæ*, *Fringillidæ*].

— Nests and Eggs of Indian Birds. Rough Draft. Part ii. Calcutta: 1874. 8vo, pp. 237-489. [See "Oology."]

LEGGE, W. VINCENT. On the distribution of Birds in the southern hill-region of Ceylon. *Ibis*, 1874, pp. 7-34.

An interesting paper, replete with field-notes.

RAMSAY, R. W. [See WALDEN, Viscount.]

SALVADORI, T. Catalogo sistematico degli Uccelli di Borneo, con note ed osservazioni di G. Doria ed D. Beccari intorno alle specie da essi raccolte nel Ragiato di Sarawak. *Ann. Mus. Genov.* v. pp. i.-lii. 1-430, pls. i.-vi.

After a general introductory notice of the Avifauna of Borneo and the adjacent parts of the Malayan Archipelago, of which a map is given, followed by tables illustrating the geographical distribution of Bornean birds, the author gives a full list of the 392 species believed to have occurred in the island. Several genera and species are new, and many figured for the first time. [*Caprimulgidae*, *Cuculidae*, *Picidae*, *Capitonidae*, *Pittidae*, *Turdidae*, *Timeliidae*, *Sylviidae*, *Nectariniidae*, *Laniidae*, *Charadriidae*.]

SCLATER, P. L. On the *Prionochili* of British India. *Ibis*, 1874, pp. 1-3, pl. i. [See *Nectariniidae*.]

—. Notice of Père David's Travels in China. *Tom. cit.* pp. 167-172.

An epitomized account of the French traveller's voyages.

STOLICZKA, F. Letters from. *Str. Feath.* ii. pp. 461-463.

Describes birds noticed in Cashmir and Kashgar during the writer's journey with the Yarkand Mission. One species is new [*Corvidae*].

SWINHOE, R. On some Birds from Hakodadi, in Northern Japan. *Ibis* 1874, pp. 150-166, pl.

68 species, collected by Mr. Blakiston, 2 of them new [*Sylviidae*, *Emberizidae*]. 2 *Chelidones* figured [*Hirundinidae*].

—. Notes on Chinese Ornithology. *Tom. cit.* pp. 266-270, pl. x. [*Falconidae*, *Strigidae*].

—. Ornithological Notes made at Chefoo (Province of Shantung, North China). *Tom. cit.* pp. 422-447.

The first part of a more than usually interesting paper. One species is new [*Turdidae*].

WALDEN [ARTHUR HAY], Viscount. On a Further Collection of Birds made by Lieut. R. W. Ramsay in the Andaman Islands. *Tom. cit.* pp. 127-149, pls. iv.-vi.

In continuation of the author's previous contribution (*Zool. Rec.* x. p. 33), 42 additional species being added, the working out of the synonymy and the critical observations being of the first order. [*Strigidae*, *Corvidae*.]

AUSTRALIAN REGION.

BULLER, W. L. Notes on the Ornithology of New Zealand. *Tr. N. Z. Inst.* vi. pp. 112-118.

Gives remarks on Dr. Finsch's paper (*Zool. Rec.* ix. p. 30).

BULLER, W. L. Remarks on Captain Hutton's notes on certain species of New Zealand Birds. *Tom. cit.* pp. 123-126.

Critical notes, more particularly on *Rallus dieffenbachii* and *R. philippensis* [*Rallidæ*].

—. On the Ornithology of New Zealand. *Op. cit.* vii. pp. 197-211, pls. vii. & viii.

The first part of this paper is a general introduction to the study of the subject, designed for the use of colonists, and accompanied by diagrams. The second part consists of numerous notes and additions to this author's "Birds of New Zealand" [*Zool. Rec.* ix. p. 30], based chiefly on examinations of the collection in the Canterbury Museum.

—. Notes on certain disputed species of New Zealand Birds. *Tom. cit.* vii. pp. 211 & 212.

—. On some additions to the collections of Birds in the Colonial Museum. *Tom. cit.* pp. 224 & 225.

The additions to the New Zealand fauna are *Numenius uropygialis* and *N. cyanopus*. Remarks on other birds are given.

—. Letter from. *Ibis*, 1874, pp. 93 & 94.

Notes on *Hieracidea novæ-zealandiæ*, *Tribonyx mortieri*, and *Rallus modestus*.

—. Notes on the Ornithology of New Zealand. *Tom. cit.* pp. 112-122.

Reply to Capt. Hutton's remarks [*infra*: see also *Rallidæ*].

FINSCH, O. Preliminary Remarks on some New Zealand Birds. *Tr. N. Z. Inst.* vii. pp. 226-236.

Remarks on and additions to previous papers of the author's [*Zool. Rec.* ix. p. 30].

—. Zusätze und Berichtigungen zur Revision der Vögel Neuseelands. *J. f. O.* 1874, pp. 167-224.

A complete review of the ornithology of New Zealand, with geographical tables and notes on the doubtful species. An invaluable paper to the student of antarctic ornithology.

HAAST, J. Remarks on the Extinct Birds of New Zealand. *Ibis*, 1874, pp. 209-220. [*Dinornithidæ*.]

HUTTON, F. W. Notes on certain Birds of New Zealand. *Tom. cit.* pp. 34-43.

Chiefly criticisms on Dr. Buller's book [*Zool. Rec.* x. p. 34].

—. The Geographical Relations of the New Zealand Fauna. *Ann. N.H.* (4) xiii. pp. 25-39, 85-102.

MEYER, A. B. Über neue und ungenügend bekannte Vögel von Neu-Guinea und den Inseln der Geelvinksbai. *Mittheilungen* i.-vi. *SB. Ak. Wien*, lxix. 1, pp. 74-90, 202-218, 386-402, 493-509; lxx. 1, pp. 110-129, 200-238; 'Alphabetischer Index.

One of the most important contributions of the year. Contains a vast amount of new information respecting rare Moluccan species, besides

describing many novelties discovered by the author during his travels in New Guinea. These are mentioned under their respective families. The Index gives alphabetical references to all the author's foregoing papers on the ornithology of New Guinea. [*Cf.* Finsch, *Abh. Ver. Brem.* 1874, p. 118; Sclater, *Ibis*, 1874, pp. 416-420.]

POTTS, T. H. Notes on the Birds of New Zealand. *Zool. (s. s.)*, 1874, pp. 3936-3942, 3979-3987, 4014-4021.

Excellent field observations. Two new species are suggested [*Apterygidae*].

——. On the Birds of New Zealand, Part iv. *Tr. N. Z. Inst.* vi. pp. 139-153.

Field notes in continuation of the author's former papers [*Zool. Rec.* ix. p. 32], one species [*Procellariidae*] being considered undescribed.

NEARCTIC REGION.

ALLEN, J. A. Notes on the Natural History of portions of Dakota and Montana Territories. III. Report on the Birds, pp. 44-68. *P. Bost. Soc.* xvii.

The topography of the region visited is discussed in a preliminary note. The report on the avifauna consists of a list of 118 species, interspersed with field notes, &c. Notwithstanding the aridity of the country and exceeding paucity of trees, birds are comparatively numerous, though restricted as to species. The universally distributed prairie forms are:—*Plectrophanes ornatus* and *P. macdoni*, *Calamospiza bicolor*, *Sturnella ludoviciana* (var. *neglecta*), *Eremophila alpestris*, *Poæetes gramineus*, *Centronyx bairdi*, *Neocorys spraguei*, *Coturniculus passerinus*, *Spizella pallida*, *Molothrus pecoris*, *Chordiles popetue* (var. *henrii*), *Zenaidura carolinensis*, and *Actiturus bartramius*. By far the most abundant woodland birds are:—*Tyrannus verticalis*, *T. carolinensis*, and *Melanerpes erythrocephalus*, *Mimus carolinensis*, *Harporhynchus rufus*, *Dendroica aestiva*. *Pipilo maculatus* (var. *articus*), and *Troglodytes aedon*, seem to be the next frequent in occurrence.

BAIRD, S. F., BREWER, T. M., & RIDGWAY, R. A History of North American Birds. Land Birds, vols. i.-iii. Boston: 1874. 4to.

The labours of the best American ornithologists have been bestowed on this work, Professor Gill contributing introductory remarks upon the distinctive characters of the class *Aves*, as regards other vertebrates, and Dr. Coues the tables of the orders and families. Dr. Brewer has written the accounts of the life history of the birds, and their scientific history has been excellently unfolded by Professor Baird and Mr. Ridgway, the latter of whom has thoroughly worked out the birds of the order *Accipitres*. The new species described in the present volumes will be found noticed under their respective families.

COUES, E. Birds of the North West. A Hand-book of the Ornithology of the region drained by the Missouri River and its tributaries. Miscellaneous publications, No. 3, United States Geological Survey of the Territories. Washington: 1874. 8vo, pp. i.-xi., 1-791.

The most complete account of the ornithology of the district of which

this work treats, embodying all the observations of previous authors, and adding abundance of new information gathered from the expeditions of Dr. Hayden, under the auspices of whose department the work is published.

COUES, E. Ornithology of the Prybilow Islands. 1873: 4to.

Not seen by the Recorders.

DALL, W. H. Notes on the Avifauna of the Aleutian Islands, especially those west of Unalashka. P. Cal. Ac. 1874, pp. 1-12.

45 species are mentioned.

FINSCH, O. Ueber eine Vögelsammlung aus Südwest-Grönland. Abh. Ver. Brem. 1874, pp. 99-117.

Although the collection here treated of only contains 28 species, the notes given by the author are excellent, and contain many valuable remarks on several Greenland birds.

——. Vögel. "Die zweite Deutsche Nordpolarfahrt" (Leipzig: 1874, 8vo), ii. Zoologie, 4, pp. 178-239 (with notes by Adolf Pansch).

Adds 11 species to Graah's 23 from East Greenland. Of these, nearly all are found in Iceland, 21 in Spitzbergen, 29 in Arctic America, and 26 in Northern Asia. Very detailed descriptions with synonymy are given in some instances. See also *tom. cit.* pp. 240-243 [OOLOGY], for notes by Prof. Newton on the eggs found during this expedition.

GENTRY, T. G. On Habits of some American species of Birds. P. Ac. Philad. 1874, pp. 96-110.

Notes on *Molothrus pecoris*, *Agelaius phoeniceus*, *Sturnella magna*, *Icterus spurius*, *Corvus americanus*, and *C. ossifragus*, *Tyrannus carolinensis*, *Myiarchus crinitus*, *Antrostomus vociferus*, *Trochilus colubris*, *Coccyzus americanus*, and *Melanerpes erythrocephalus*, in the State of Pennsylvania.

LAWRENCE, G. N. Birds of Western and North-Western Mexico, based upon collections made by Col. A. J. Grayson, Capt. J. Xanthus, and Ferd. Bischoff. Mem. Bost. Soc. ii. pp. 265-319.

316 species are enumerated, with original notes by the collectors.

RIDGWAY, R. The Lower Wabash Valley, considered in its relations to the faunal districts of the Eastern Region of North America. P. Bost. Soc. xvi. pp. 304-332.

The author divides his subject into the following parts:—1, relation of the Lower Wabash Valley to the faunal districts of the Eastern Region of North America, and characteristic of its avifauna; 2, climatic influence on colour; 3, migration and nesting. As a general summary he notes:—Numbers, found irrespective of season, 77; found only in summer, 92; in winter, 47; during spring and fall, 72—a total of 288. Number of species breeding, about 155; and number of species wintering, about 155.

——. Catalogue of the Birds ascertained to occur in Illinois. Ann. Lyc. N. York, xi. pp. 364-394.

Gives the occurrence and range of each species.

——. [See BAIRD, S. F.]

NEOTROPICAL REGION.

BERLEPSCH, H. VON. Zur Ornithologie der Provinz Santa Catharina, Süd Brasilien. J. f. O. 1874, pp. 241-284.

Finishes the paper noticed in Zool. Rec. x. p. 39.

CABANIS, J. Uebersicht der von Herrn Carl Euler im District Cantagallo, Provinz Rio de Janeiro, gesammelten Vögel. *Tom. cit.* pp. 81-90, 225-231.

Species belonging to the families *Fringillidae* and *Tyrannidae* are described as new. Altogether 228 are recorded from the locality.

DUBOIS, A. Remarques sur la variabilité de certaines espèces du genre *Calliste*. Bull. Ac. Belg. (2) xxxviii. pp. 124-129.

Of the 16 known species of the above South American genus, the author only admits 10, looking upon the others as races or varieties. His idea is, that in their range of space or geographical distribution typical specific forms obtain, and that those less trenchantly marked, owing to climatic and other influences, ought not to be specifically distinguished.

ELLIOT, D. G. Notes on the *Trochilidae*. The genus *Helianthea*. *Ibis* 1874, pp. 330-335. [*Trochilidae*.]

GUNDLACH, J. Neue Beiträge zur Ornithologie Cubas. J. f. O. 1874 pp. 114-165, 286-303.

Continues the author's researches [Zool. Rec. ix. p. 84].

——. Beitrag zur Ornithologie der Insel Portorico. *Tom. cit.* pp. 304-315.

Reviews the labours of previous authors, adds his own experiences, and gives a complete list of the 142 birds now known from the island.

HARTING, J. E. On the Lapwing of Chili. P. Z. S. 1874, pp. 449-452. [*Charadriidae*.]

LANDBECK, L. Zur Ornithologie Chiles. Arch. f. Nat. xl. pp. 112-114. [*Psittacidae*, *Laridae*.]

LAWRENCE, G. N. Descriptions of four new species of Birds from Costa Rica. Ann. Lyc. N. York, xi. pp. 88-91. [*Corvidae*, *Caprimulgidae*, *Columbae*, *Rallidae*.]

PELZELN, A. VON. Ueber eine Sendung von Vögeln aus Ecuador. Verh. z.-b. Wien, xxiv. pp. 171-174.

29 species enumerated, with descriptions of some hitherto unnoticed phases of plumage, &c.

REED, E. C. Remarks on the Birds of Juan Fernandez and Masafuera. *Ibis*, 1874, pp. 81-84.

Adds several species to Dr. Sclater's paper (Zool. Rec. viii. p. 43), 11 species being now known from these islands.

SALVIN, O. [See SCLATER, P. L., & SALVIN, O.] 1874. [VOL. XI.]

- SCLATER, P. L. On the species of the genus *Synallaxis* of the family *Dendrocolaptidae* [q. v.]. P. Z. S. 1874, pp. 2-28, pls. ii.-iv.
- On a small collection of Birds from Barbadoes, West Indies. *Tom. cit.* pp. 174 & 175.
- 9 species mentioned.
- On the Neotropical species of the family *Pteroptochidae* [q. v.]. *Ibis*, 1874, pp. 188-206, pl. viii.
- SCLATER, P. L., & SALVIN, O. On Peruvian Birds collected by Mr. Whitely. Part viii. P. Z. S. 1874, pp. 677-680, pl. lxxxiv.
- In continuation of former articles [*Zool. Rec.* x. p. 38]. 32 species enumerated, with critical remarks on 9 of them. [*Tinamidae*.]
- SHARPE, R. B. On the genus *Todus*. *Ibis*, 1874, pp. 344-355, pl. xiii. [*Todidae*.]
- TACZANOWSKI, L. Description des oiseaux nouveaux de Pérou central. P. Z. S. 1874, pp. 129-140, pls. xix.-xxi. [*Trochilidae*, *Formicariidae*, *Pteroptochidae*, *Dendrocolaptidae*, *Cotingidae*, *Tyrannidae*, *Cerebidae*, *Troglodytidae*, *Tanagridae*, *Fringillidae*.]

ANATOMY AND PHYSIOLOGY.

- ALIX, E. Sur la détermination du muscle long supinateur chez les Oiseaux. *J. Zool.* iii. pp. 21-25.

After a comparison of the parts in various groups of *Mammalia* and *Reptilia*, the author admits the presence of a *supinator longus* muscle in birds, with the subjoined reservation. In Mammals, the long supinator has three kinds of insertion; viz., to the proximal end of radius, to its distal end, and to the carpus or metacarpus. In the Crocodile, the two former obtain, and are named superior and inferior external supinators. In Lizards, there is a slight variation. In birds, the homologue of the upper Reptilian muscle is present, and, if that be regarded as the *supinator longus* in the latter, the same name is applicable in the case of birds.

- Essai sur l'appareil locomoteur des Oiseaux. Paris: 1874. Pls. i.-iii.; abstract in *J. Zool.* iii. pp. 476-481.

Starting from a typical ideal of the locomotive apparatus in the vertebrate animals generally, the author endeavours to show what this becomes in birds. He discusses elaborately the anatomical structure of the Avian limbs, and specially those concerned in flight, comparing them with those of *Reptilia* and *Mammalia*, and examining the different modes of aerial, aquatic, and terrestrial progression. Finally, from the anatomical facts, he traces out the theory of the bird's movements. Notwithstanding visible resemblances in some respects to both Reptiles and certain Mammals, he regards the Avian group as a clearly defined type, with a special adaptation of function—flight—everything in a manner being subordinated thereto. Variability undoubtedly exists, but, according to the author, does not alter a certain persistence of character, distinctive of the groups. He doubts the former existence of a veritable ancestral parent, with mutations in progeny arriving at the Avian form.

ALIX, E. Memoire sur l'Ostéologie et la Myologie du *Nothura major*. J. Zool. iii. pp. 167-214, 252-282, pls. viii.-xi.

The skeleton has been examined in detail, free references to Prof. Parker's labours being made. There is a brief comparison of Mammalian and Reptilian structural points, followed by those of birds generally and more fully. The muscular structures have received great attention, and to these the illustrations are devoted. The myological characters of *Nothura* are indicated as—1. An external humeral division of the biceps. 2. The disposition of the bands going to the 5th and 6th dorsal spinous processes. 3. A coracoidean fascicle of the subscapularis inserted upon the supra-episternal epiphysis. 4. Division of the flexor tendon of the terminal phalanx of the 2nd digit carried over the pollex. Other muscular and tendinous dispositions of the pectoral region and limbs, belong partly to those of the *Struthiones* and partly to those of the *Galline*, *Columbæ*, *Rallidæ*, &c. From these anatomical facts, the author agrees with the usually accepted opinion that the Tinamous form a group *sui generis*, but with diverse affinities. [*Tinamidæ*.]

BERNHARDT, M. Ueber den Zuckerstich bei Vögeln. Arch. Anat. Phys. lix. pp. 407-413.

Details some experiments with reference to the effects of puncturing the *medulla oblongata* in Pigeons. With obvious deviations and occasional negative results, the author's researches partly confirm those of Bernard and Schieff. Birds differ somewhat from Mammals as to the results of this lesion, digestion being arrested, besides formation of sugar in liver and kidneys.

COUES, E. Birds of the North-West [*antea*, p. 31].

The Osteology of the *Laridæ* and other anatomical data concerning these and the families of North American Birds, will be found dispersed throughout this work.

DARESTE, C. Mémoire sur l'origine et le mode de formation des monstres doubles. Arch. Z. expér. iii. pp. 73-118.

A summary of the laws tending to the production of double monstrosities, based on previous researches, chiefly on the common Fowl. The author's formula is to the effect that double monsters among the Vertebrate animals result always by a soldering or fusion, more or less complete, of two embryos produced upon a single cicatricula.

EYTON, T. C. List of plates of skeletons of birds that have been published. Wellington: 1874, 12mo, pp. 1-15.

This list is very imperfectly put together, and is by no means a complete record.

GARROD, A. H. On certain Muscles of Birds and their Value in Classification. (Part II.) P. Z. S. 1874, pp. 111-123, pl. xvii.

The author adopts symbols expressive of the presence of certain muscles, and, by putting these into a myological formula, he arranges the groups of birds in circles; the affinities being derived from likeness, and the possession or want of these muscles. With 16 possible combinations, he finds there are 8 types of thigh muscular arrangements. The femoro-

caudal varies most. The individuals of a species are said to agree in their myological arrangements, so far as the above are concerned. Genera likewise coincide, unless where the alliance is false. In families, there is apparently less precision; and as to orders, doubt yet reigns. Using the ambiens muscle as a key, the typically kneed birds (typical, because the ambiens runs in the tendon of the knee) are termed *Homalogonatzæ*, and all others *Anomalogonatzæ*. The accompanying tabular view conveys the author's idea of the serial disposition of the Class *Aves*. In those divisions with an asterisk (*) appended, none of the genera have an ambiens muscle; with a dagger (†), that muscle is wanting in certain genera only.

Sub-Class HOMALOGONATÆ.

Ord. I. GALLIFORMES.

- Cohort *a*. STRUTHIONES. Fam. 1, Struthionidæ; (sub-fam. Struthioninæ, Rheinæ). 2, Casuariidæ*. 3, Apterygidæ. 4, Tinamidæ.
β. Gallinacæ. Fam. 1, Palamedeidæ. 2, Gallinæ. 3, Rallidæ. 4, Otididæ; (sub-fam. Otidinæ, Phœnicopterina). 5, Musophagidæ. 6, Cuculidæ; (sub-fam. Centropodinæ, Cuculinæ).
γ. Psittaci†.

Ord. II. ANSERIFORMES.

- a*. Anseres. Fam. 1, Anatidæ. 2, Spheniscidæ. 3, Colymbidæ. 4, Podicipidæ*.
β. Nasutæ. Fam. 1, Procellariidæ†. 2, Fulmaridæ; (sub-fam. Fulmarinæ, Bulweriinæ).

Ord. III. CICONIIFORMES.

- a*. Pelargii.
β. Cathartidæ.
γ. Herodiones*.
δ. Steganopodes. Fam. 1, Phaethontidæ. 2, Pelecanidæ. 3, Phalacrocoracidæ. 4, Fregatidæ.
ε. Accipitres. Fam. 1, Falconidæ. 2, Strigidæ*.

Ord. IV. CHARADRIIFORMES.

- a*. Columbæ†. Fam. 1, Columbidae. 2, Pteroclidæ.
β. Limicolæ. Fam. 1, Charadriidæ. 2, Gruidæ. 3, Laridæ. 4, Alcidae.

Sub-Class ANOMALOGONATÆ.

Ord. I. PICIFORMES.

- Fam. 1, Picariæ (sub-fam. Picidæ, Ramphastidæ, Capitonidæ).
 2, Upupidæ. 3, Bucerotidæ. 4, Alcedinidæ.

Ord. II. PASSERIFORMES.

- Fam. 1, Passeres. 2, Bucconidæ?. 3, Trogonidæ. 4, Meropidæ. 5, Galbulidæ. 6, Caprimulgidæ. 7, Steatornithidæ. 8, Coraciidæ; (sub-fam. Coraciinæ, Momotinæ, Todinæ?).

Ord. III. CYPSELIFORMES.

- Fam. Macrochires: (sub-fam. Cypselinæ, Trochilinæ).

GARROD, A. H. On some points in the anatomy of the *Columbæ*. *Tom. cit.* pp. 249-259. [*Columbæ*.]

— On some points in the anatomy of the Parrots which bear on the classification of the sub-order. *Tom. cit.* pp. 586-598, pls. lxx. & lxxi. [*Psittaci*.]

— On the "Showing off" of the Australian Bustard (*Eupodotis australis*). *Tom. cit.* pp. 471-473.

The sexual and periodical great swelling of the throat in this species, heretofore ascribed to the development of a gular pouch, is shown to be due to an enlargement of the œsophagus, and there is no separate sac in front of the trachea, as obtains occasionally in *Otis tarda*.

— Further note on the mechanism of the "Show off" in the Bustards. *Tom. cit.* pp. 673 & 674.

In a young pouchless male of *Otis tarda*, instead of a *frenum lingue*, two slight, lateral vertical folds and a median depression were found; in another specimen, supposed to be a female, a *frenum lingue* was present. It is inferred, therefore, from these conditions with superadded strain on the distended pharynx, that in the adult male alone the stretching of the parts permits of the formation of a true gular pouch.

GERVAIS, H. Note sur un cas de Métopagie, compliqué de pro-encephalie observé chez le Canard domestique. *J. Zool.* iii. pp. 380-385, pl. xiii.

The abnormality in question is among the rarest, four instances alone being as yet recorded; three human (*Mus.* and *Hist. Cat. Coll. Surg.*, in which case the cranially united beings lived till 9 years old), the fourth avian (Tiedemann, 1829). In the present case, the crown and entire upper parts of head and beak are joined together, but without absolute fusion, the brains being each comparatively perfect and separate, though bridged by a more or less continuous layer of dura-mater.

HECTOR, J. On *Cnemidornis calcitrans*, Owen, showing its affinity to the Lamellirostrate Natatores. *Tr. N. Z. Inst.* vi. pp. 76-84, pls. x.-xiv. A.

A descriptive account of the major portion of the skeleton of this New Zealand bird. The skull, 12 cervical and 4 dorsal vertebrae, sternum, furcula, right humerus, right metacarpal, sacrum, femur, both tibiae, tarso-metatarsal, and 6 ribs, are passed in review and figured. The humerus equals the femur in length, instead of being 1-9th less, as in Owen's specimen. From its structure, and the form of the skull and sternum, the author concludes that its affinities lie with the Geese (*Cereopsis*), the power of flight becoming obsolete. It differs from them, however, in its short, lofty head, very solid palate, and characteristic tympanic cavity, which is bridged by a bony process between the mastoid process and basi-occipital. Except part of the sternum, all the bones are close-grained, and in the fresh state possibly contained oily matter.

In *P. Z. S.* 1874, p. 307, the author corrects a clerical error in the above communication (and in *P. Z. S.* 1873, p. 763) to the effect that in *Cnemidornis calcitrans* the humerus is relatively to its bulk much heavier than in the genera *Ocydromus*, *Stringops*, *Nestor*, and *Hieracidea*.

JOBERT, A. J. Recherches pour servir à l'histoire de la digestion chez les Oiseaux. C. R. lxxvii. pp. 133 & 134.

From a study of the gizzard of the Ostrich, and of the glands connected therewith, the author believes it prepares an acid secretion, and is not exclusively a triturating organ.

MAREY, J. Physiologie du vol des oiseaux ; du point d'appui de l'aile sur l'air. C. R. lxxviii. pp. 117-121.

A summary of the dynamical principles involved in an attempt by mechanical apparatus to reproduce strokes of a wing similar to that of a bird, and sufficient to raise weights. The resultant of all the aerial pressures on a triangular wing is about its middle, or 3-5ths from articulation. The artificial wing must be driven 3 or 4 times faster than that of a bird. The latter's horizontal translation modifies the resistance required to lower the wing, and thence the *point d'appui* in flight [*cf.* Zool. Rec. vii. p. 21].

MIVART, St. G. On the axial skeleton of the Ostrich, *Struthio camelus*. Tr. Z. S. viii. pp. 385-451 (with 79 woodcuts).

A preliminary investigation of the affinities of Birds and Reptiles (*Sauropsida*) through the *Struthiones*. In the vertebræ, the term "paraxial" is used to denote the facies towards the head, and reversely "postaxial" for that towards the tail; "dorsal" and "ventral" being respectively applied to the other surfaces. The spinal column is detailed in regions, followed by the ribs and sternum. Vertebral formula given as -17 c.; 3 cerv. dors.; 5 d. (true); 2 (3 ?) dors. lumb.; 8 l.; 3 s.; 8 sac. caud.; 10 (8 ?) c. true. An elaborate description of each vertebra is given; and in the lumbo-sacral region the original separate parts are examined, and compared with those of the immature bird. The composition of the pelvis receives due attention, as likewise the constitution of the sternum and rib elements.

MURIE, J. On the nature of the sacs vomited by the Hornbills. P. Z. S. 1874, pp. 420-425.

Figures of the empty gizzard sacs ejected by *Buceros subcylindricus* are given, and also of the microscopical structure of the same. The latter clearly proves that this strange rejection is no other than the epithelial coating of the stomach, and which must therefore be renewed in an incredibly short space of time, again to be thrown off. [*Bucerotidæ*.]

——. On the Skeleton and Lineage of *Fregilupus varius*. Tom. cit. pp. 474-488, pls. lxi. & lxii.

The osteology of this bird (supposed to be extinct) has now for the first time been carefully described, and illustrated in detail. Comparisons with various families and allied genera are instituted, and an affinity to the Starlings deduced. [*Sturnidæ*.]

OWEN, R. Description of the Skull of a Dentigerous Bird (*Odontopteryx toliapicus*, Ow.) from the London Clay of Sheppey. J. G. Soc. xix. (1873) pp. 511-522, pls. xvi. & xvii.

A full descriptive account is given of the middle and after parts of the cranium and mandible of an undoubted bird form, possessing in both

jaws bony elevations to all intents and purposes equivalent to teeth. These singular and forwardly directed denticles, consist apparently of bone tissue rather than that distinguishing true teeth. In shape, situation, &c., they agree with the latter, but, unlike the fossil (Cretaceous) *Ichthyornis*, are not implanted in distinct sockets. The contour of the skull, orbital areas, and presence of quadrate, show alliances with the swimming birds. Besides figures of this rare and extraordinary specimen, a restoration in outline has been attempted, and sectional views of the microscopic structure of the teeth are given.

PÉNAUD, A. Historique de la question du glissement de l'oiseau dans l'air. C. R. lxxviii. pp. 329-332.

Calls in question Marey's priority (*cf.* also Planavergne, *tom. cit.* p. 262; Tresca, *tom. cit.* pp. 466-471), and gives a summary of the leading authorities who have previously advocated the laws of aerial motion. The author seeks to produce a mathematical formula expressive of the bird's displacement and translation.

SABATIER, A. Observations sur les Transformations du Système Aortique dans la Série des Vertébrés. Ann. Sc. Nat. (5) xix. pp. 1-33, pl. x.

The result of these embryological studies is somewhat at variance with the universally adopted notions of Rathke, concerning the development of the aortic blood-vessels. Of the five left primitive branchial arches in the bird, the author believes the 4th and 5th branches to be those which are arrested, and that from the 3rd (and not 4th) the brachial artery is derived. From this and other considerations respecting the development of the heart, it is that the original left aorta receives little blood, and finally disappears, whilst augmentation and the early relative importance of the brachiocephalic vessel ensues.

WOOD-MASON, J. On the occurrence of a superorbital chain of bones in the Arboricolæ (Wood-Partridges). J. A. S. B. (2) xliii. pt. 2, pp. 254 & 255, pl. ii. [*Tetraonidae.*]

OOLOGY.

BROWN, J. A. HARVIE. Letter from. Ibis, 1874, pp. 96 & 97.

On the breeding of some New Zealand birds.

HARTING, J. E. On the eggs of some rare or little known *Limicolæ*. P. Z. S. 1874, pp. 454-460, pl. lx. [*Charadriidæ*, *Scolopacidæ*, *Glareolidæ.*]

HUME, A. O. Nests and Eggs of Indian Birds. Rough draft. Part ii. Calcutta: 1874, 8vo, pp. 237-489.

In continuation of the part noticed in Zool. Rec. x. p. 44.

NATHUSIUS, W. VON. Nachweis des speciesunterschiedes von *Corvus corone* und *Corvus cornix*, und ihrer häufigen Verbastardirung an den Eierschalen. J. f. O. (4) 1874, ii. pp. 1-26.

The value of the microscopic structure of the egg-shell as a means of specific diagnosis is insisted on; instances in point from various bird-

groups being given. Among the Crows, the "mammillæ" in transverse sections of the egg-shell of *Corvus frugilens* and *C. monedula* yield very closely approximate results. The egg-shell in *Corvus corone* and *C. cornix* has been subjected to a detailed investigation, with the result that the minute mammillæ are proportionately far larger in the former than in the latter species. [*Corvidæ*.]

NEWTON, A. Eier. "Die zweite Deutsche Nordpolarfahrt" (Leipzig: 1874, 8vo.) ii. Zoologie, 5, pp. 240-243 (translated by G. Hartlaub).

Eggs of *Plectrophanes nivalis*, *Lagopus rupestris*, *Ægialitis hiaticula*, *Calidris arenaria*, *Sterna arctica*, *Larus glaucus*, and *Somateria mollissima*, recorded from E. Greenland.

PANCERI, P. Cryptogams in the Interior of Eggs. Q. J. Micr. Sci. xiv. p. 178.

Records the growth of a fungus within the shell of a fresh egg (Ostrich). From experiments, the author finds the unbroken shell permeable to fluids, and states that he has succeeded in introducing germs from an affected egg to the interior of a sound one.

ROBINSON, J. Minute egg-shaped deposits on shell of hen's egg. *Tom. cit.* p. 107.

ACCIPITRES.

BROOKS, W. E. Notes on some European and Asiatic Eagles. *Ibis*, 1874, pp. 84-87.

Aquila fulvescens, Gray, *A. vindhiana*, Frankl., and *A. navioides*, Cuv., are three distinct species; *A. orientalis*, Cab., = *A. bifasciata*, Gray, and *A. hastata*, Less., = *A. maculata* (Gm.).

HAAST, J. On *Harpagornis*, an extinct genus of gigantic raptorial birds of New Zealand. Tr. N. Z. Inst. vi. pp. 62-75, pls. vii.-ix.

Describes and figures various bones of this huge raptorial form, of which two species are now recognized, *H. moorii* [Zool. Rec. ix. p. 38] and *H. assimilis*, sp. n.

SHARPE, R. BOWDLER. Catalogue of the *Accipitres* or Diurnal Birds of Prey in the collection of the British Museum. London: 1874, 8vo, pp. 480, pls. i.-xiv.

377 species are described in the present volume, which contains at the same time synoptical tables of the families, genera, and species. [*Cf.* Hume, Str. Feath. ii. pp. 501-503.]

— Contributions to a history of the *Accipitres* or Birds of Prey.

I. On the females of the Common and South African Kestrels.

P. Z. S. 1874, pp. 580-584, pls. lxviii.

A female Kestrel with a blue tail is noticed from England, and fresh specific characters are drawn up between *Cerchneis tinnunculus* and *C. rupicola*.

SUNDEVALL, CARL J. Förneyad anordning ar Dagrofvoglarna (Dispositio nova Accipitrum Hemeroharpagorum). Öfv. Ak. Förh. 1874, pp. 21-39.

A new arrangement of the Diurnal Birds of Prey, very different from that proposed two years ago by the author [Zool. Rec. ix. p. 217]. The following new genera are instituted: — *Leptohierax*, substituted for *Cooperastur* (Type, *L. cooperi*), *Chirospizias*, substituted for *Erythrospiza* (*C. griseigularis*), *Nothierax* (*N. xanthothorax*), *Pterolestes* (*P. augur*), *Dromolestes*, substituted for *Crazirex* (*D. galapagensis*).

Plangus, g. n., type, *P. neogeus*, sp. n., Brazil; *id. t. c.* p. 28.

VULTURIDÆ.

Sarcorhamphus æquatorialis, sp. n., Ecuador. R. B. Sharpe, Cat. B. i. p. 21.

Enops, g. n.; type, *Æ. aura* (L.); *id. t. c.* p. 25 [= *Rhinogryphus*; R. Ridgway, B. N. Am. p. 337]. *Æ. pernigra*, sp. n., Amazon Region, *id. t. c.* p. 27; *Æ. falklandica* [Zool. Rec. x. p. 44] and *Æ. urubitinga* (Pelz.) figured, *id. t. c.* pl. ii. figs. 1 & 2.

Gyps hispaniolensis, sp. n., Spain and N. Africa; *id. tom. cit.* p. 6.

Gyps kolbi figured; *id. t. c.* pl. i.

Pseudogryphus, g. n.; type, *P. californianus*; R. Ridgway, N. A. Birds, iii. p. 38.

FALCONIDÆ.

Circus melanoleucus, juv., figured; R. Swinhoe, Ibis, 1874, pl. x.

Astur atricapillus, var. n. *striatulus*, W. America; R. Ridgway, *tom. cit.* p. 240.

Astur macroscelides, Hartl., and *A. toussenelli* (Verr.), figured; R. B. Sharpe, Cat. B. i. pls. iii. & iv.: *A. cuculoides* (Temm.) and *A. soloensis* (Lath.), figured; *id. op. cit.* pl. iv. figs. 1 & 2: *A. leucosomus*, sp. n., New Guinea; *id. op. cit.* p. 119: *A. wallacii*, sp. n., Lombeck; *id. op. cit.* p. 128, pl. v.

Astur sp. n. ? (foss.). A tarsus from Mauritius, not referable to any known Raptorial bird, though apparently most resembling that of *Astur melanoleucus*, from the Cape of Good Hope. A. Milne-Edwards, Ann. Sci. Nat. (5) xix. p. 25.

Micronisus poliopsis, sp. n., N. Pegu; A. O. Hume, Str. Feath. ii. p. 325.

Urotriorchis, g. n., type, *U. macrurus* (Hartl.); R. B. Sharpe, Cat. B. i. p. 83.

Dinospizias, g. n., type, *Astur pectoralis* (Cuv.); J. Cabanis, J. f. O. 1874, p. 228.

Accipiter nigroplumbeus, Lawr., is probably distinct from *A. ventralis*, ScL.; O. Salvin, Ibis, 1874, p. 325.

Accipiter hartlaubi figured; A. Dubois, R. Z. 1874, p. 1, pl. i.; R. B. Sharpe, Cat. B. i. pl. vi. fig. 2.

Erythrocnema, g. n., type, *E. uncinata* (Temm.); R. B. Sharpe, Cat. B. i. p. 84 [= *Antenor*, Ridgway, B. N. Am. p. 249].

Buteo borealis, var. n. *costaricensis*, Costa Rica; R. Ridgway, N. A. Birds, iii. p. 285.

Buteo plumipes (Hodgs.), and *Archibuteo strophiatatus*, Hodgs., figured; Sharpe, *tom. cit.* pl. vii. figs. 1 & 2. *B. ferox* (type of *B. aquilinus*, Hodgs.), figured; *id. tom. cit.* pl. viii.

- Heterospizias*, g. n., type, *H. meridionalis* (Lath.); *id. tom. cit.* p. 160.
- Aquila maculata*. On its nomenclature: H. E. Dresser, Ann. N. H. (4) xii. p. 373.
- Aquila boeckii*, sp. n., *A. clanga*, juv., and *A. orientalis*, juv., figured; E. von Homeyer, J. f. O. 1874, pls. iii. & iv.
- Aquila chrysaetus* breeding in India; W. H. Unwin, P. Z. S. 1874, pp. 208-212.
- Circæetus gallicus*, *Aquila pennata*, *A. nipalensis*, and *Nisaetus fasciatus*, figured; H. E. Dresser, B. Eur. pts. xxix., xxxii., xxxiii., & xxxiv.
- Nisaetus pennatus*. On its nestlings: H. Saunders, Ann. N. H. (4) xiv. p. 136.
- Spizaetus devillii*, sp. n., ad. & juv., Baiza, Ecuador; A. Dubois, Bull. Ac. Belg. (2) xxxviii. pp. 129-131, pls. i. & ii.
- Lophotriorchis*, g. n., type, *L. kieneri* (St. Hil.); R. B. Sharpe, Cat. B. i. p. 255.
- Spilornis pallidus* [Zool. Rec. ix. p. 38] figured; *id. tom. cit.* p. 290.
- Dryotriorchis*, g. n., type, *D. spectabilis* (Schl.); G. E. Shelley, Ibis, 1874, pp. 90 & 91.
- Rostrhamus sociabilis*, var. n. *plumbeus*, Florida; R. Ridgway, N. A. Birds, iii. p. 209.
- Milvus melanotis* (T. & S.) = *M. govinda*, Sykes; W. E. Brooks, Ibis, 1874, p. 461.
- Milvus niger*, pull., figured; A. Marchand, R. Z. (3) ii. pl. xii.
- Baza cuculoides* (Sw.), *B. magnirostris*, Gray, *B. erythrothorax* [Zool. Rec. x. p. 47], and *B. sumatrensis* (Lafr.), figured; R. B. Sharpe, Cat. B. i. pls. x. & xi.
- Falco minor*, Bp., figured; *id. tom. cit.* pl. xii.
- Falco communis*. Five varieties noticed; R. Ridgway, N. A. Birds, iii. pp. 128 & 129.
- Falco communis*, var. n. *pealii*, N. W. America; *id. t. c.* p. 137.
- Falco sacer* and *F. hendersoni* are distinct; A. O. Hume, Str. Feath. ii. pp. 530 & 531.
- Æsalon lithofalco*, var. n. *suckleyi*, W. America; R. Ridgway, N. A. Birds, iii. p. 147.
- Hierax melanoleucus* fully described; A. O. Hume, Str. Feath. ii. p. 525.
- Hierax*, Vigors, nec Leach, is re-named *Microhierax*; R. B. Sharpe, Cat. B. i. p. 366.
- Hieracidea*. The existence of two new species in New Zealand insisted upon, and details figured; W. L. Buller, Tr. N. Z. Inst. vii. pp. 213 & 214, pl. ix.
- Hierofalco*. Nine varieties noticed under the head of two species, *H. gyrfalco* and *H. lanarius*. R. Ridgway, N. A. Birds, iii. pp. 107-109.
- Hierofalco holbælli* [Zool. Rec. x. p. 47] figured; R. B. Sharpe, Cat. B. i. p. 415.
- Erythropus vesperinus* and *E. amurensis* in India; A. O. Hume, Str. Feath. ii. pp. 527-529.
- Tinnunculus sparverius*, var. n. *australis*, Brazil; R. Ridgway, N. A. Birds, iii. p. 166.

STRIGIDÆ.

Strix (Athene) murivora, sp. n. (foss.). Founded on leg bones from caverns of Rodriguez. Alph. M.-Edwards, Ann. Sci. Nat. (5) xix. p. 13; pl. xi., and Recherches, &c. [*suprà*, p. 23], p. 128, pl. xxix. Possibly allied to *Athene superciliaris*, Vieill. (*A. polleni*, Schleg.).

Strix —, sp. n. (foss.). Extinct, from Rodriguez caverns, and only known from a tibia. This corresponds in length with that of *Otus brachyotus*, but has a larger inferior extremity. *Id. tom. cit.* xix. p. 13.

Noctua hoedti [Zool. Rec. viii. p. 50]. Young described; A. B. Meyer, SB. Ak. Wien, lxi. 1, pp. 396 & 397.

Spheotyto cunicularia, var. n. *guadeloupensis*, Guadeloupe; R. Ridgway, N. A. Birds, iii. p. 90.

Pholeoptynx cunicularia. On its habits in the Argentine Republic; W. H. Hudson, P. Z. S. 1874, pp. 308-311.

Lempys erythrocampa, sp. n., Canton; R. Swinhoe, Ibis, 1874, p. 269.

Scops modestus, sp. n., Andaman Islands: Lord Walden, Ann. N. H. (4) xiii. p. 123.

Scops asio, var. n. *floridanus*, Florida; R. Ridgway, N. A. Birds, iii. p. 48: var. *enano*, C. America, *id. t. c.* p. 48.

Syrnium nebulosum, var. n. *sartorii*, E. Mexico; *id. tom. cit.* p. 29.

Ninox obscurus [Zool. Rec. ix. p. 40] and *N. affinis* [*op. cit.* iv. p. 83] figured; Ld. Walden, Ibis, 1874, pls. iv. & v.

Syrnium indranee. On its habits in Ceylon; W. V. Legge, Str. Feath. ii. pp. 342-348.

Strix tenebriosa, from New Guinea; A. B. Meyer, SB. Ak. Wien, lxi. 1, p. 396.

Strix flammea, var. n. *guatemalæ*, Guatemala; R. Ridgway, N. A. Birds, iii. p. 11.

PSITTACI.

GARROD, A. H. On some points in the anatomy of the Parrots which bear on the Classification of the Sub-order. P. Z. S. 1874, pp. 586-598, pls. lxx. & lxxi.

82 species (39 genera) examined relative to their carotid arteries, ambiens muscle, furcula and oil gland. Tabular views of agreements and dissimilarities of the series in the points in question are given. From such data the phylogeny of the group is attempted. Two guiding principles are insisted on: 1st. "An anatomical character is so much the more or less certain to have been an element of the original type, or ancestor whence sprang the class, order, family, or genus, under consideration, as it is more or less frequently found in the less intimately related minor divisions of the groups under observation." 2nd. "There is no such thing as reversion to lost ancestral anatomical characters." He infers there must have been an ancestral Parrot, with 2 symmetrically disposed carotids, an ambiens muscle, furcula, and tufted oil gland. In it, cæca, gall bladder, and the postacetabular portion of the tensor fasciæ muscle

were absent or soon lost, whilst its beak, tongue, crop, and rectrices were after the normal pattern. Collating the structural details as above of the existing *Psittaci*, a pedigree tree is formed, and a classification adopted as follows:—

SUB-ORD. PSITTACI.

Fam. I. PALÆORNITHIDÆ. Left carotid normal; no ambiens muscle; 2 carotids (except in *Cacatua*).

Sub-fam. 1. PALÆORNITHINÆ. No further deviation. *Palæornis*, *Eclectus*, *Aprosmictus*, *Tanygnathus*, *Prioniturus*, *Psittinus*, *Loriculus*, *Trichoglossus*, *Lorius*, and *Eos*.

Sub-fam. 2. CACATUINÆ. Orbital ring completely ossified, with process bridging temporal fossa. *Calopsitta*, *Calyptrorhynchus*, *Licmetis*, *Eolophus*, *Cacatua*.

Sub-fam. 3. STRINGOPINÆ. Furcula lost. *Stringops*, *Euphema*, *Geopsittacus*, *Melopsittacus*, *Agapornis*.

Fam. II. PSITTACIDÆ. Left carotid superficial.

Divis. 1. Ambiens muscle present.

Sub-fam. 4. ARINÆ. No further deviation. *Ara*, *Conurus*, *Bolborhynchus*, *Caica*, *Psittacus*, *Pæocephalus*, *Nestor*.

Divis. 1. Ambiens muscle wanting.

Sub-fam. 5. PYRRHURINÆ. No further deviation. *Pyrrhura*, *Lathamus*, *Coracopsis*, *Pyrrhulopsis*.

Sub-fam. 6. PLATYCERCINÆ. Furcula lost. *Platycercus*, *Psephotis*, *Cyanorhamphus*, *Psittacula*.

Sub-fam. 7. CHRYSOTINÆ. Oil gland lost. *Chrysotis*, *Pionus*, *Brotoerys*.

PSITTACIDÆ.

HUME, A. O. Die Papageien, von Dr. O. Finsch. Str. Feath. ii. pp. 1–28. [See BIBLIOGRAPHY.]

SCHLEGEL, H. Revue de la collection des Perroquets (*Psittaci*) faisant partie du Musée des Pays Bas. Leide: 1874, pp. 1–84.

The collection of Parrots at Leiden now reaches the large number of 2237 specimens, as against 1204 in 1864, when the author issued his first catalogue. *Stringops* is re-named *Stringopsis*, p. 43.

WALDEN, Viscount. [See BIBLIOGRAPHY.]

Psittacus mauritianus. The tibia of this extinct species figured in various positions; A. Milne-Edwards, Ann. Sc. Nat. (5) xix. pl. xv. [See ETHIOPIAN REGION.]

Necropsittacus rodericanus, g. & sp. nn. (foss.), Rodriguez, with affinities to *Lorus* and *Palæornis*. Upper and lower mandibles figured and described; id. Ann. Sc. Nat. (5) xix. p. 18, pl. xiii.; and Recherches, &c., p. 133, pl. xxxi.

Conurus cyanolyseus and *C. patagonus*, Mol. & V., compared: they are probably specifically distinct. L. Landbeck, Arch. f. Nat. xl. pp. 114–116.

Eclectus. A. B. Meyer, who has given much attention to this genus during his travels in New Guinea and the adjacent islands, finds by

dissection that the green-coloured individuals are males and the red females. He would therefore unite *E. polychlorus*, *E. linnæi*, *E. grandis*, *E. intermedius*, *E. cardinalis*, *E. westermanni*, and *E. corneliæ* as one species. Zool. Gart. 1874, pp. 161-175; cf. also Verh. z.-b. Wien, xxiv. pp. 179-190. These views as to the distinction of sexual coloration in part corroborated; A. Pagenstecher, Verh. Ver. Heidelb. 1874, p. 77.

Aprosmictus insignissimus, sp. n., Queensland; J. Gould, P. Z. S. 1874, pp. 499 & 500.

Platycercus dorsalis, notes on; A. B. Meyer, SB. Ak. Wien, lxi. 1, pp. 397-399.

Platycercus unicolor and *P. novæ-zealandiæ*. Heads figured; W. L. Buller, Tr. N. Z. Inst. vi. pp. 121-123.

Platycercus rowleyi, sp. n., New Zealand; *id. op. cit.* vii. pp. 219 & 220.

Palæornis exsul [Zool. Rec. ix. p. 40]. Sternum and mandible figured and referred to; A. Milne-Edwards, Ann. Sc. Nat. (5) xix. p. xiii.; and Recherches, &c., p. 132, pl. xxxi.

Palæornis calthropæ, *P. rosa*, & *P. cyanocephala* figured; J. Gould, B. of Asia, pt. xxvi.

Palæornis finschi, Tenasserim, A. O. Hume, Str. Feath. ii. pp. 509 & 510; *P. tyleri*, Andamans; *id.* P. A. S. B. 1874, p. 108: spp. nn.

Chrysotis canipalliata, New Granada, p. 105, *C. panamensis*, Panama, p. 349, spp. nn. J. Cabanis, J. f. O. 1874.

Chrysotis finschi [Zool. Rec. i. p. 69] figured; P. L. Sclater, P. Z. S. 1874, pl. xxxiv.

Pionias pucherani, and its variations in different localities; A. B. Meyer, SB. Ak. Wien, lxx. 1, pp. 220-225.

Pionias simplex, sp. n., New Guinea; *id.* Verh. z.-b. Wien, xxiv. p. 39.

Psittacella brehmi and *P. modesta*. Notes on the plumage; *id.* J. f. O. 1874, pp. 74-76.

Psittacula andina, sp. n., Eastern Peru; O. Finsch, P. Z. S. 1874, p. 91.

Psittacula diophthalma, remarks on; A. B. Meyer, SB. Ak. Wien, lxi. 1, pp. 213 & 214.

Coryllis occipitalis, sp. n., Mindanao; O. Finsch, Ibis, 1874, p. 208.

TRICHOGLOSSIDÆ.

Dasyptilus pecqueti. On its generic position; T. Salvadori, Atti Acc. Tor. ix. p. 630.

Trichoglossus wilhelminæ, sp. n., New Guinea; A. B. Meyer, J. f. O. 1874, pp. 56 & 57.

Trichoglossus pulchellus. ♂ adult described; *id.* SB. Ak. Wien, lxi. 1, pp. 76 & 77.

Trichoglossus placens and *T. rubrinotatus*, notes on; *id. tom. cit.* pp. 400 & 401.

Trichoglossus cyanogrammus and its allies; *id. op. cit.* lxx. 1, pp. 225-227.

Trichoglossus (Charmosyna) arfaki, New Guinea, p. 37, and *kordoanus*, Mysore, p. 38, spp. nn.; *id.* Verh. z.-b. Wien, xxiv.

Domicella lori and varr., including var. n. *jobiensis*, with remarks on *D. cyanauchen*, *D. cyanogenys*, *D. furcata*, and *D. scintillata*; *id.* SB. Ak. Wien, lxx. 1, pp. 227-238.

.PICARIÆ.

PICIDÆ.

Picus variegatus, Wagler (*nec* Lath.), re-named *Jyngipicus fuscoalbidus*; T. Salvadori, Ann. Mus. Genov. v. p. 42.

Jyngipicus aurantiiventris [Zool. Rec. v. p. 71] figured; *id. t. c.* pl. iv. fig. 2.

Callolophus, g. n.; *id. t. c.* p. 49.

Gecinus nigrigenis, sp. n., Tenasserim; A. O. Hume, Str. Feath. ii. pp. 444-447; = *G. erythropygius*, R. Wardlaw-Ramsay, P. Z. S. 1874, pp. 212 & 213, pl. xxxv.

Picumnus granadensis, Lafr., = *P. olivaceus*, Lafr., juv.; O. Salvin, Ibis, 1874, p. 323.

Melanerpes formicivorus, var. n. *striatipectus*, Central America; R. Ridgway, N. A. Birds, ii. p. 561.

Hypoxanthus brevirostris, sp. n., Central Peru; L. Taczanowski, P. Z. S. 1874, p. 546.

TROGONIDÆ.

Pharomacrus xanthogaster, sp. n., Bogota; H. Turati and T. Salvadori, P. Z. S. 1874, p. 652.

MEROPIDÆ.

Merops quinticolor, from India, is re-named *swinhoii*; A. O. Hume, Str. Feath. ii. p. 163.

TODIDÆ.

SHARPE, R. B. On the genus *Todus*. Ibis, 1874, pp. 344-355, pl. xiii.

5 species admitted and full synonymy given. *T. pulcherrimus*, sp. n., Jamaica (?), fig. 3; *T. subulatus*, Gould, figs. 1 & 2.

ALCEDINIDÆ.

SCHLEGEL, H. Revue de la collection des Alcédines faisant partie du Musée des Pays Bas. Leide: 1874. 8vo, pp. 1-47.

Shows the additions which have taken place in the Leiden collection since 1863. In the latter year the museum contained 544 specimens of Kingfishers; it has now 1335.

Alcedo rufigastra [Zool. Rec. x. p. 49] is from Assam, and may be called *A. beavani*; Ld. Walden, Ann. N. H. (4) xiv. p. 158: = *A. asiatica*; A. O. Hume, Str. Feath. ii. p. 494.

Pelargopsis intermedia, sp. n., Nicobars; A. O. Hume, *tom. cit.* p. 166; R. B. Sharpe, *ibid.* p. 489.

Pelargopsis gigantea, sp. n., Sulu Islands, near Borneo; Lord Walden, Ann. N. H. (4) xiii. p. 123; Meyer, *tom. cit.* pp. 401 & 475.

Carcineutes amabilis [Zool. Rec. x. p. 49] = *C. pulchellus*; R. B. Sharpe, Str. Feath. ii. pp. 484 & 485. Is different; A. O. Hume, *tom. cit.* pp. 485 & 486.

Halcyon saturator, sp. n., Andamans; A. O. Hume, Str. Feath. ii. p. 168.

Tanysiptera schlegeli [Zool. Rec. viii. p. 33] = *T. riedeli* [op. cit. iii. p. 79]; A. B. Meyer, SB. Ak. Wien, xlix. 1, pp. 77 & 78.

CAPITONIDÆ.

Megalëma humii [Zool. Rec. vii. p. 43] = *Chotorea mystacophonus*, juv. A series of heads figured to prove this. T. Salvadori, Ann. Mus. Genov., v. pp. 34-37, pl. i.

Megalëma incognita, sp. n., Tenasserim; A. O. Hume, Str. Feath. ii. pp. 442 & 443, 486 & 487.

RHAMPHASTIDÆ.

Aulacorhamphus calorhynchus, Merida, *A. erythrognaethus* and *phæolæmus*, Venezuela, spp. nn.; J. Gould, Ann. N. H. (4) xiv. pp. 183 & 184.

BUCEROTIDÆ.

MURIE. J. On the nature of the sacs vomited by the Hornbills. P. Z. S. 1874, pp. 420-425.

The empty gizzard-sacs thrown up by *Buceros subcylindricus* are figured, and illustrations of the microscopic structure of the same given in detail. These remarkable cast-up bags are proved to be no other than the horny layer or epithelial lining of the gizzard itself. Incredible though it may appear, fresh and successive stomach-linings must be rapidly developed, seeing that these ejecta (not semi-digested pellets, but sacs, enclosing uninjured fruit) are formed almost daily, and evidently intended to be wrappers for the safe transport of food to the young.

CUCULIDÆ.

Cuculus canorus. Three eggs in a nest of *Motacilla alba*; H. Thiele, J. f. O. 1874, pp. 80 & 81.

Centropus anselii, sp. n., Gaboon; R. B. Sharpe, P. Z. S. 1874, p. 204, pl. xxxiii. fig. 1.

Chrysococcyx splendidus (nec Gray), New Guinea; A. B. Meyer, SB. Ak. Wien, lxi. 1, p. 82.

Coccytes glandarius figured; H. E. Dresser, B. Eur. pt. xxviii.

Heterococcyx, g. n.; type, *H. neglectus* (Schl.). T. Salvadori, Ann. Mus. Genov. v. p. 61.

Eurycercus cinerascens, sp. n., Lower Bengal; Ld. Walden, Ann. N. H. (4) xiv. p. 156.

MUSOPHAGIDÆ.

On *Turacus albocristatus* and the spectral bands of the Turacine extracted from its feathering; J. J. Monteiro, Q. J. Sc. (2) iv. p. 132.

CAPRIMULGIDÆ.

Caprimulgus borneensis (Wallace), sp. n., Borneo; T. Salvadori, Ann. Mus. Genov. v. p. 117.

Caprimulgus ruficollis figured; H. E. Dresser, B. Eur. pt. xxxiv.

Caprimulgus macrurus, remarks on; A. B. Meyer, SB. Ak. Wien, lxi. 1, pp. 210 & 211.

Egotheles dubius, sp. n., Mount Arfak, New Guinea; id. t. c. p. 75.

Podargus ocellatus, remarks on; id. t. c. pp. 209 & 210.

Batrachostomus castaneus, Darjeeling, *B. punctatus*, Ceylon, spp. nn.; A. O. Hume, Str. Feath. ii. pp. 348-355.

Stenopsis albicauda, sp. n., Costa Rica; G. N. Lawrence, Ann. Lyc. N. Y. xi. pp. 89 & 90.

CYPSELIDÆ.

Cypselus melba, *C. apus*, *C. unicolor*, and *C. affinis* figured; H. E. Dresser, B. Eur. pts. xxxi. & xxxiii.

Cypselus subfurcatus from Chanda; A. O. Hume, Str. Feath. ii. p. 524.

Cypselus terre-reginæ, sp. n., Rockingham Bay; E. P. Ramsay, P. Z. S. 1874, p. 601 [is a *Collocalia*].

Dendrochelidon mystacea, remarks on; A. B. Meyer, SB. Ak. Wien, lxx. 1, pp. 218-220.

Collocalia francica and *C. fuciphaga*, on their synonymy; Ld. Walden, Ibis, 1874, pp. 132-136. *C. innominata* and *C. inexpectata* [Zool. Rec. x. p. 52] = *C. francica*, and *C. affinis* [op. cit. iv. p. 90] = *C. fuciphaga*; id. t. c. pp. 133 & 136.

TROCHILIDÆ.

ELLIOT, D. G. Notes on the *Trochilide*. The genus *Helianthea*. Ibis, 1874, pp. 330-335.

8 species recognized and their synonymy given.

MULSANT, E., & VERREAUX, É. Histoire Naturelle des Oiseaux-mouches ou Colibris, constituant la famille des Trochilides. Lyon: 1874, 4to, pp. i.-v., 1-343, pls. i.-xv.

A monograph worked out in a very complete and available form, and embracing the results of many years' assiduous study on the group. A general introduction to the family is given, and the special part contains synopses of the genera and species, with their full geographical distribution. Several subgenera are proposed for the first time, the following being apparently new names:—*Anisoterus* (p. 72), *Milornis* (p. 77), *Placophorus* (p. 137), *Crinis* (p. 178), *Clotho* (p. 269), *Myletes* (p. 284). The species figured are *Eutoxeres aquila*, *Grypus æquatorialis*, *Glaucis antoniae*, *Phaethornis augusti*, *Pygmornis idalie*, *P. adolphi*, *Eupetomena macrura*, *Campylopterus ensipennis*, *Lampornis mango*, *Doryptera euphrosine*, *Leucochloris albicollis*, *Aithurus polytmus*, *Diphogena hesperus*, *Oreonympha nobilis*, *Thalurania lerchi* [cf. Zool. Rec. iii. pp. 83 & 84].

WHITELY, H. Further notes on Humming-birds collected in High Peru
P. Z. S. 1874, pp. 675 & 676.

The habits of 4 species described [Zool. Rec. x. p. 52].

Eriocnemis chrysorama, sp. n., ? Ecuador; D. G. Elliot, Ann. N. H. (4)
xiii. p. 375.

Eucephala. 9 species enumerated, including *E. subcærulea*, sp. n.,
Brazil; *id.* Ibis, 1874, pp. 87-89.

Hylocharis flavifrons, Pelz. (Orn. Bras. p. 33), = *Chlorostilbum prasinum*;
id. t. c. p. 89.

Thalurania jelskii, *Helianthea dichrura*, *Metallura hedvigæ* (pl. xxi.
fig. 2), *Eriocnemis sapphiropygia*, spp. nn., *Lamproaster branickii*, g. &
sp. nn. (pl. xxi. fig. 1), Central Peru; L. Taczanowski, P. Z. S. 1874, pp.
138-140, pl. xxi.

Leucippus pallidus, sp. n., Central Peru; *id.* l. c. p. 542.

Urolampira eupogon, sp. n., Central Peru; J. Cabanis, J. f. O. 1874,
p. 97.

PASSERES.

SUNDEVALL, C. J. Ny anordning av de Trastartade Foglarna (Oscines
Cichlomorphæ). Öfv. Ak. Förh. 1874, pp. 27-30.

The author here modifies the arrangement given in his "Methodi
Naturalis Avium disponendarum Tentamen" [Zool. Rec. ix. p. 22].

PITTIDÆ.

SCHLEGEL, H. Revue de la collection des Brèves (Pitta) faisant partie
du Musée des Pays Bas. Leide: 1874. 8vo, pp. 1-19.

Since the year 1863, when the author published the first catalogue of
Pittæ in the Leiden Museum, the collection has reached to 349 examples.

Pitta novæ-guinææ-méfoorana, sp. n., Méfoor; *id.* tom. cit. p. 8.

Pitta cyanoptera off the Philippines; T. Salvadori, Atti Acc. Tor. ix.
p. 631.

Pitta bertæ [Zool. Rec. v. p. 76, viii. p. 56] figured; *id.* Ann. Mus.
Genov. v. pl. iii.

FORMICARIIDÆ.

Myrmotherula. 5 species recognized in Central America, north of
Darien; O. Salvin, Ibis, 1874, p. 311.

Herpsilochmus motacilloides and *Myrmotherula atrigularis*, spp. nn.;
L. Taczanowski, P. Z. S. 1874, pp. 136 & 137.

MENURIDÆ.

Orthonyx novæ-guinææ, sp. n., Arfak Mountains, New Guinea; A. B.
Meyer, SB. Ak. Wien, lxix. 1, pp. 83-85.

PTEROPTOCHIDÆ.

SCLATER, P. L. On the Neotropical species of the family *Pteroptochidæ*.
Ibis, 1874, pp. 188-206, pl. viii.

1874. [VOL. XI.]

8 genera and 19 species are recognized. *Rhinocrypta fusca* [Zool. Rec. x. p. 53] figured.

Scytalopus sylvestris, sp. n., Central Peru; L. Taczanowski, P. Z. S. 1874, p. 138.

DENDROCOLAPTIDÆ.

SCLATER, P. L. On the species of the genus *Synallaxis* of the family *Dendrocolaptidæ*. P. Z. S. 1874, pp. 2-28, pls. ii.-iv.

After the literary history of the genus, the author gives the synonymy of each species, with a careful diagnosis, and an account of its range, so that the paper is of a monographic character. 58 species are recognized, and their geographical distribution given in a tabular form, including as new (pp. 10, 20, 25) *Synallaxis hypospodia*, Bahia, *S. subpudica*, Columbia, *S. subcristata*, Venezuela, and *S. hudsoni*, Argentine Republic. *S. stictothorax*, Scl., *S. scutata*, Scl., *S. kollari*, Pelz., *S. candæi*, Lafr. & D'Orb., *S. hyposticta*, Pelz., *S. subcristata*, Scl., are figured, pls. ii. figs. 1 & 2, iii. figs. 1 & 2, iv. figs. i. & 2.

Synallaxis pudibunda, *S. graminicola*, and *S. virgata*, spp. nn., Central Peru; *id. tom. cit.* pp. 445 & 446. The first two figured, pl. lviii.

Schizæaca palpebralis [Zool. Rec. x. p. 53] figured; J. Cabanis, J. f. O. 1874, pl. ii. fig. 2.

Coprotretis jelskii, sp. n., Central Peru; *id. tom. cit.* p. 98.

Thripadectes virgaticeps, Ecuador, G. N. Lawrence, Ann. Lyc. N. York, x. pp. 398 & 399; *T. scrutator*, Central Peru, L. Taczanowski, P. Z. S. 1874, p. 137: spp. nn.

Geositta saxicolina, sp. n., Central Peru; L. Taczanowski, *tom. cit.* p. 524.

Upucerthia serrana, sp. n., Central Peru; *id. tom. cit.* p. 525.

Anabazenops cabanisi, sp. n., Central Peru; *id. tom. cit.* p. 528.

MELIPHAGIDÆ.

Myzomela rosenbergi [Zool. Rec. viii. p. 56], remarks on, and young described; A. B. Meyer, SB. Ak. Wien, lxix. 1, pp. 211 & 212.

Myzomela cruentata, New Guinea, *M. rubribrunnea*, spp. nn.; *id. op. cit.* lxx. 1, pp. 202-204. *M. erythrocephala*, Gould, remarks on; *id. t. c.* pp. 204-206.

Melirrhophetes, g. n., types, *M. leucostephes* and *M. ochromelas*, spp. nn., Arfak Mountains, New Guinea; *id. op. cit.* lxx. 1, pp. 110-112.

Xanthotis poikilosternus [*pacilo*], sp. n., Arfak Mountains; *id. tom. cit.* pp. 112 & 113.

Tropidorrhynchus jobiensis, sp. n., Jobi, *T. novæ-guineæ* and allies, pp. 113-115; *T. gilolensis*, Temm., and *T. inornatus*, Gray & Mitch., remarks on, pp. 210-215; *id. tom. cit.*

Ptilotis pyrrhotis, sp. n., Jobi; *id. tom. cit.* pp. 206 & 207. *P. megarrhyncha*, Gray, and *Xanthotis chrysotis* (Less.), remarks on; *id. tom. cit.* pp. 208-210.

Glycyphila modesta, Gray, remarks on ; *id. tom. cit.* p. 215.

Ptilotis frenata, sp. n., Queensland ; E. P. Ramsay, P. Z. S. 1874, p. 603.

Zosterops albiventer, var. n. *minor*, Jobi and Mysore Islands, p. 115 ; *Z. mysorensis*, sp. n., Mysore, p. 116 : A. B. Meyer, *tom. cit.*

NECTARINIIDÆ.

SALVADORI, T. Intorno al genere *Hermotinia*, Reich. Atti Acc. Tor. x. pp. 201-234, pl.

After giving a careful review of the literature, and a geographical table illustrating the range of each species, the author diagnoses and enumerates the eleven species with which he is acquainted. *Chalcostetha chlorolæma*, Salvadori [*infra*, nec Jardine] is re-named *Hermotinia theresia*, and figured with *H. sanghirensis*, Meyer. Although modestly called a 'note' on the genus, this paper is really a very complete monograph.

Chalcostetha aspasia (Less.) "stirps" *geelvinkiana*, including the following "varieties," *maforensis*, *mysorensis*, *jobiensis*, from the islands of Geelvink Bay ; A. B. Meyer, SB. Ak. Wien, lxx. 1, pp. 122-124.

Chalcostetha sangirensis, sp. n., Sanghir ; *id. t. c.* p. 124, note.

Æthopyga cara, sp. n., Tenasserim ; A. O. Hume, Str. Feath. ii. p. 473.

Prionochilus melanozanthus (Hodgs.) and *P. vincens* figured ; P. L. Sclater, Ibis, 1874, pl. i.

Pachyglossa melanozantha from Sikkim ; A. O. Hume, Str. Feath. ii. p. 455.

Dicæum nigrimentum, sp. n., Borneo, T. Salvadori, Ann. Mus. Genov. v. p. 165.

Dicæum geelvinkianum, sp. n., Islands of Geelvink Bay, pp. 120 & 121 ; *D. pectorale*, M. & S., remarks on, pp. 121 & 122 ; A. B. Meyer, *tom. cit.*

Arachnophila, g. n. ; type, *A. simplex* (Müll.). Salvadori, *op. cit.* v. p. 172.

Cosmetira eques (Less.), remarks on ; A. B. Meyer, *tom. cit.* pp. 215-218.

Lobornis, g. n., type, *L. alexandri*, sp. n., Old Calabar ; R. B. Sharpe, Ann. N. H. (4) xiv. p. 63.

EURYLEMIDÆ.

SALVADORI, T. Intorno al genere *Cymborhynchus*. Atti Acc. Tor. ix. pp. 418-429.

3 species recognized and their full synonymy given. *C. malaccensis* is distinct from *C. macrorhynchus*.

COTINGIDÆ.

Doliornis sclateri, g. & sp. nn., Central Peru ; L. Taczanowski, P. Z. S. 1874, pp. 135 & 136, pl. xx.

Hemipipo tschudii, sp. n., Central Peru ; J. Cabanis, J. f. O. 1874, p. 99.

TIMELIIDÆ.

Malacocincla rufiventris, sp. n., Borneo; T. Salvadori, Ann. Mus. Genov. v. p. 229.

Kenopia, "Blyth" (? publ.) *striata* figured; *id. tom. cit.* pl. v. fig. 2.

Setaria pectoralis figured; *id. tom. cit.* pl. iv. fig. 1.

Cyanoderma, g. n., type, *C. erythropterum* (Blyth); *id. tom. cit.* p. 213.

Paradoxornis heudii [Zool. Rec. x. p. 54] and *P. austeni*, sp. n., figured; J. Gould, B. of Asia, pt. xxvi.

Trochaloxyton blythi [Zool. Rec. viii. p. 57] figured; *id. op. cit.* pt. xxvi.

Ægithina tiphia = *Æ. zeylonica*; A. O. Hume, Str. Feath. ii. pp. 459-480.

Gampsorhynchus torquatus, sp. n., *id. t. c.* pp. 446 & 447, & P. A. S. B. 1874, p. 107.

Alcippe collaris, sp. n., Upper Assam; Ld. Walden, Ann. N. H. (4) xiv. p. 156.

Brachypteryx brunneiventris, sp. n., New Guinea; A. B. Meyer, SB. Ak. Wien, lxix. 1, pp. 497 & 498.

Dryocataphus cleaveri, sp. n., Fantee; G. E. Shelley, Ibis, 1874, pp. 89 & 90.

Trichostoma minor, sp. n., Tenasserim; A. O. Hume, Str. Feath. ii. pp. 535 & 536.

Turdinus garoensis, sp. n., Garo Hills; H. H. Godwin-Austen, J. A. S. B. (n.s.) pt. 2, 1874, p. 160, pl. viii.

Actinodura waldeni (pl. xii.), sp. n., Nágá Hills, and *Malacocercus rubiginosus*, sp. n., Manipúr Valley; *id. P. Z. S.* 1874, pp. 46 & 47.

HIRUNDINIDÆ.

Cotyle rupestris figured; H. E. Dresser, B. Eur. pt. xxviii.

Chelidon blakistoni, Swinh., and *C. whitelii*, Swinh. [= *C. lagopoda*, Pall.], figured; R. Swinhoe, Ibis, 1874, pl. vii. figs. 1 & 2.

ORIOLIDÆ.

Mimeta striata (Q. & G.), remarks on; A. B. Meyer, SB. Ak. Wien, lxx. 1, p. 218.

VIREONIDÆ.

Granatellus francescæ, Baird, figured; O. Salvín, Ibis, 1875, pl. xi.

Phenicomanes iora, g. & sp. nn., Jamaica; R. B. Sharpe, P. Z. S. 1874, pp. 427 & 428, pl. liv. [= *Iora lafresnayii*, Hartl., from Malacca, the locality also being an error].

Vireosylvia calidris, var. n. *barbadense*[-sis], Barbadoes; R. Ridgway, B. N. Amer. i. p. 359. *V. magister*, sp. n., Honduras; S. F. Baird, *tom. cit.* p. 359.

TYRANNIDÆ.

Empidonax brunneus, Parana, *E. axillaris*, Orizaba, *E. pectoralis*, Panama, *E. griseipectus*, Ecuador, *E. griseigularis*, Panama, spp. nn.; R. Ridgway, B. N. Amer. ii. pp. 363-365.

Empidonax andinus, sp. n., Central Peru; L. Taczanowski, P. Z. S. 1874, p. 539.

Rhynchocyclus peruvianus, sp. n., Central Peru; *id. t. c.* p. 537.

Myiobius superciliosus, sp. n., Central Peru; *id. t. c.* p. 538.

Corythopsis humivagans, *Ochthæca thoracica*, *Muscisaxicola rufipennis*, *Leptopogon auritus*, *Pogonotriccus ophthalmicus*, spp. nn., Central Peru; *id. t. c.* pp. 133-137.

Ochthodicta signatus, sp. n., Central Peru; *id. t. c.* p. 532.

Ceratotriccus, g. n., type, *Todirostrum furcatum*, Lafr.; J. Cabanis, J. f. O. 1874, p. 87.

Euscarthmus pyrrhops, sp. n., Central Peru; *id. t. c.* p. 98.

Mecocerculus tæniopterus, sp. n., Central Peru; *id. t. c.* p. 98.

Elania semiflava, Lawr., = *Capsiempis flaveola* (Licht.); O. Salvin, Ibis, 1874, p. 309.

Myiodynastes atrifrons, Sel., = *Saurophagus bairdi*, Gambel; *id. t. c.* p. 324.

Myiarchus flammulatus, sp. n., Tehuantepec; G. N. Lawrence, Ann. Lyc. N. York, xi. pp. 71 & 72.

CEREBIDÆ.

Dacnis xanthophthalma, sp. n., and *Dacnidea leucogastra*, g. & sp. nn. (pl. xix. fig. 2), Central Peru; L. Taczanowski, P. Z. S. 1874, p. 131.

Conirostrum cyaneum, sp. n., Central Peru; *id. t. c.* p. 512.

LANIIDÆ.

Lanius excubitor and allies; J. Cabanis, J. f. O. 1874, pp. 233-237.

Collyrio ludovicanus, var. n. *robustus*, California; S. F. Baird, B. N. Amer. i. p. 420.

Lanius speculigerus, sp. n., Dauria; L. Taczanowski, J. f. O. 1874, pp. 322 & 323.

Dryoscopus coronatus, sp. n., Gaboon; R. B. Sharpe, P. Z. S. 1874, p. 205, pl. xxxiii. fig. 2 [= *Laniarius luhderi*; A. Reichenow, J. f. O. 1874, p. 101].

Rectes jobiensis, p. 205, *R. obscura*, p. 390, spp. nn., Jobi Island, with remarks on *R. cirrocephala*, Less., p. 207, and *R. nigrescens*, Schl. [Zool. Rec. viii. p. 58], p. 390; A. B. Meyer, SB. Ak. Wien, lxix. 1. *R. ben-netti* [Zool. Rec. x. p. 56] = *R. nigrescens*, juv. [*op. cit.* viii. p. 58]; *id. op. cit.* lxx. i. p. 126 (this identification doubtful; P. L. Sclater, Ibis, 1874, p. 419).

Hyloterpe occipitalis, sp. n., Andamans; A. O. Hume, Str. Feath. ii. p. 202.

Myiolestes melanorhynchus, sp. n., Mysore Island; A. B. Meyer, *op. cit.* lxix. 1, p. 494.

Myiolestes megarhynchus, remarks on; A. B. Meyer, *tom. cit.* pp. 208 & 209.

Pachycephala hattamensis, p. 391, *P. affinis*, p. 392, spp. nn., New Guinea; *P. senex* [Zool. Rec. ix. p. 47] is from Manem Island, pp. 393 & 394; *P. griseiceps*, var. n. *jobiensis*, Jobi, p. 394; *P. flavigrisea*, sp. n., New Guinea; pp. 495 & 496: *id. tom. cit.*

Eopsaltria (?) *inornata*, sp. n., Queensland; E. P. Ramsay, P. Z. S. 1874, p. 604.

Phæornis obscura (Gm.) = *Pithys rufigula* (Bodd.); A. von Pelzeln, Ibis, 1874, pp. 461 & 462.

CAMPEPHAGIDÆ.

Campephaga montana, Arfak Mountains, New Guinea, *C. maforensis*, Island of Mafoor, *C. incerta*, Jobi Island, spp. nn., with remarks on *C. plumbea*, *C. bojeri*, and *C. melas*; A. B. Meyer, *tom. cit.* pp. 386-390. The ♀ of *C. strenua*, Schleg. [Zool. Rec. viii. p. 58], described; *id. tom. cit.* p. 211. *C. aurulenta*, Selater [Zool. Rec. x. p. 56], = *C. sloeti*, Schleg.; *id. op. cit.* lxx. 1, p. 125.

Campephaga fulgida, sp. n., W. Africa; A. Reichenow, J. f. O. 1874, pp. 345 & 346.

Pityriasis gymnocephala figured; T. Salvadori, Ann. Mus. Genov. v. frontispiece.

Graucalus papuensis, Gm., *desgrazii*, Puch., *atriceps* (Müll. & Schl.), *magnirostris*, Forsten, and *melanolorus*, Gray, are all attributed to one species; A. B. Meyer, *op. cit.* lxxix. 1, p. 505.

Cracticus crassirostris, sp. n., New Guinea?; T. Salvadori, Atti Acc. Tor. ix. pp. 430 & 431: = *C. quoyi* (Less.), juv., and *C. cassicus* (Bodd.), = *personatus*, certe; A. B. Meyer, *tom. cit.* pp. 506-508.

DICRURIDÆ.

Chætorhynchus, g. n., type, *C. papuensis*, sp. n., Arfak Mountains, New Guinea; A. B. Meyer, *tom. cit.* pp. 493-494.

MUSCICAPIDÆ.

Muscicapa collaris and *M. atricapilla* figured; H. E. Dresser, B. Eur. pt. xxxiv.

Erythrosteria sordida, sp. n., Naga Hills; H. H. Godwin-Austen, J. A. S. B. (n. s.) xliii. pt. 2, p. 158.

Siphia erythaca re-described; A. O. Hume, Str. Feath. ii. pp. 458 & 459.

Cyornis mandelli, sp. n., Sikkim; *id. t. c.* pp. 510 & 511.

Tchitrea rubiensis, sp. n., New Guinea; A. B. Meyer, *tom. cit.* pp. 494 & 495.

Todopsis cyanocephala, ♂ ad., described, pp. 78 & 79; *T. mysorensis*, sp. n., Mysore, pp. 79 & 80; *T. grayi*, Wall., ? = *Myiagra glauca*, Schleg., p. 212: *id. tom. cit.*

Myiagra atra, sp. n., Mafoor and Mysore; *id. t. c.* p. 498.

Myagroides, g. n., type, *M. conspicuus*, sp. n., Aguapim; A. Reichenow, J. f. O. 1874, p. 102.

Amaurodryas albiteriata, sp. n., Jobi; A. B. Meyer, *tom. cit.* p. 498.

Petræca hypoleuca, Gray, re-described (with some doubt) from New Guinea; it should rather be referred to *Amaurodryas*, which cannot be separated from *Pæcilodryas*: *id. tom. cit.* pp. 499-501.

Sauloprocta melaleuca (Q. & G.), ♂ juv., from Mysore, and *Rhipidura brachyrhyncha*, Schleg. [Zool. Rec. viii. p. 59], from the Arfak Mountains, p. 501; *R. rufiventris*, Müll. & Schl. (with which *R. hyperythra*, Gray, is not identical), is re-named *muelleri*, there being an earlier *Rhipidura rufiventris* from Timor (which was re-described by Müller & Schlegel as *R. ochrogastra*), p. 502; and Gray's identification of *R. setosa* (Q. & G.) with *R. gularis*, M. & S., is not considered as certain, p. 503: *id. tom. cit.*

Rhipidura rufidorsa, p. 200, Rubi and Jobi, *R. kordensis*, p. 201, Mysore, *id. op. cit.* lxx. 1; *R. superciliosa*, Queensland, E. P. Ramsay, P. Z. S. 1874, p. 604: spp. nn.

Rhipidura torrida [Zool. Rec. ii. p. 110] = *R. rufifrons*; T. Salvadori, Atti Acc. Tor. ix. p. 632.

Rhipidura threnothorax, Müll., ♀ juv. described; A. B. Meyer, *op. cit.* lxi. 1, p. 212.

Platystira minulla, sp. n., Benguela; J. V. Barboza du Bocage, J. Sc. Lisb. 1874, p. 37.

Monarcha kordensis, Mysore Island, pp. 202 & 203, *M. insularis*, Jobi, p. 395, A. B. Meyer, *tom. cit.*: spp. nn.

Monarcha guttula (Garn.), ♀ juv. described, p. 203; *Piezorhynchus rufilateralis*, Gray (= *lucidus*, Gray, ♀), = *chalybeocephalus* (Garn.), ♀ juv., for which the specific name *alecto*, Temm., is adopted; *Myiagra nitens*, Gray, is also referred to Temminck's species, which is a true *Monarcha*; *id. tom. cit.* pp. 504 & 505.

Terpsiphone nigrimitrata, sp. n., Cameroons; A. Reichenow, J. f. O. 1874, p. 110.

MNIOTILTIDÆ.

Dendrocæ capitalis [Zool. Rec. vi. p. 78], = *D. barbadensis*, Sund.; O. Salvin, Ibis, 1874, p. 306.

Dendrocæ vieilloti, var. n. *bryanti*, R. Ridgway, B. N. Amer. i. p. 218. *D. dominica*, var. n. *albilora*, Mexico; S. F. Baird, *tom. cit.* p. 241. *D. gracia*, var. n. *decora*, Honduras; *id. tom. cit.* p. 244.

Geothlypis poliocephala, var. n. *caninucha*, Guatemala; R. Ridgway, B. N. Amer. i. p. 296.

Myiodioctes pusillus, var. n. *pileolatus*, Western North America; *id. tom. cit.* p. 319.

Helminthophaga luorencii, sp. n., New Jersey; H. Herrick, P. Ac. Philad. 1874, p. 220.

Helminthophaga celata, var. n. *obscura*, Florida, and var. n. *lutescens*, W. America; R. Ridgway, B. N. Amer. i. pp. 202-205.

CINCLIDÆ.

Cinclus aquaticus figured, with review of the European forms; H. E. Dresser, B. Eur. pt. xxv.

TURDIDÆ.

Turdus apicalis, Hartl., supposed to be from West Africa, = *Margaryps montanus* (Lafr.), from Guadeloupe; J. Cabanis, J. f. O. 1874, p. 350.

Turdus nigriceps, sp. n., Central Peru; *id. t. c.* p. 97. Figured; L. Taczanowski, P. Z. S. 1874, pl. lxiv.

Turdus bivittatus, sp. n., Aguapim; A. Reichenow, J. f. O. 1874, p. 104.

Turdus chrysopleurus, sp. n., Chefoo; R. Swinhoe, Ibis, 1875, p. 444, pl. xiv. [= *Turdus pelios*, Bp.].

Turdus whitii, ♂ ad. captured in Cornwall; E. H. Rodd, J. Inst. Cornw. No. xvi. Oct. 1874, p. 58.

Geocichla andamanensis, sp. n., Andaman Islands; Ld. Walden, Ann. N. H. (4) xiv. p. 156.

Garrulax galbanus (pl. x.) and *G. albisuperciliaris*, spp. nn., Munipúr Valley; H. H. Godwin-Austen, P. Z. S. 1874, p. 44. The latter figured; *id.* J. A. S. B. (n. s.) xliii. pt. 2, pl. vi. *G. picticollis* [Zool. Rec. ix. p. 48] figured; J. Gould, B. of Asia, pt. xxvi.

Trochalopteryx cineraceum (pl. xi.) and *T. virgatum*, spp. nn., Nágá Hills; H. H. Godwin-Austen, P. Z. S. 1874, p. 46.

Copsychus andamanensis, sp. n., Andamans; A. O. Hume, Str. Feath. ii. p. 231.

Criniger falckensteini, sp. n., Loango; A. Reichenow, CB. Afrikanischen Ges. 1874, No. 10, p. 179; J. f. O. 1874, p. 458.

Crateropus salvadorii [Zool. Rec. ii. p. 112], = *Malacocercus huttoni*, Blyth; W. T. Blanford, Ibis, 1874, p. 75.

Tricholestes, g. n.; type, *T. minutus* (Hartl.). T. Salvadori, Ann. Mus. Genov. v. p. 205, pl. v. fig. 1.

Pycnonotus pusillus, sp. n., Borneo; *id. tom. cit.* p. 200.

Pericrocotus ardens figured; *id. tom. cit.* pl. ii.

Layardia rubiginosa figured; H. H. Godwin-Austen, J. A. S. B. (n. s.) xliii. pt. 2, pl. v.

Ixus sinensis figured; J. Gould, B. of Asia, pt. xxvi.

Sibia pulchella, sp. n., Nágá Hills; H. H. Godwin-Austen, Ann. N. H. (4) xliii. p. 160. Figured; *id.* J. A. S. B. (n. s.) xliii. pt. 2, p. 164.

Otocompsa personata, Hume [Zool. Rec. x. p. 58], = *Ixus analis*, Horsf.; A. O. Hume, Str. Feath. ii. pp. 333.

Pericrocotus cantonensis figured; J. Gould, B. of Asia, pt. xxvi.

Hemixus hildebrandi, sp. n., Tenasserim; A. O. Hume, Str. Feath. ii. p. 508.

Hylocichla. 8 species recognized. *H. mustelinus* [-na], *H. pallasi*, *H. nanus* [-na], *H. auduboni* (= *silens*, Swains.), *H. fuscescens*, *H. swainsoni*, *H. ustulatus* [-ta], and *H. aliciae*; T. M. Brewer, P. Bost. Soc. xvi. p. 115.

SYLVIIDÆ.

BLANFORD, W. T., & DRESSER, H. E. Monograph of the genus *Saxicola*, Bechstein. P. Z. S. 1874, pp. 213-241, pls xxxvi.-xxxix.

37 species recognized, the nomenclature being thoroughly revised, and many species united. By the examination of all the typical specimens within their reach, the authors have been able to settle questions of the greatest obscurity. *Saxicola bottæ* and *S. heuglini* [Zool. Rec. vii. p. 51] figured, pl. xxxvi. figs. 1 & 2; *S. leucomelena* figured, pl. xxxvii. figs. 1 & 2; *S. griseiceps*, *S. diluta*, spp. nn., pp. 233 & 234, pls. xxxvii. figs. 3, xxxix. fig. 1; *S. pollux*, *S. castor*, [Zool. Rec. ii. p. 113] figured, pl. xxxviii. figs. 1 & 2; *S. albicans*, tail figured, p. 236; *S. schlegeli* figured, pl. xxxix. fig. 2. [Cf. A. O. Hume, Str. Feath. ii. pp. 526 & 527.]

Saxicola rufa, *S. erythræa*, *S. stapazina*, *S. melanoleuca*, *S. deserti*, *S. leucomela*, *S. isabellina*, *S. xanthoprymna*, *S. ananthe*, figured; H. E. Dresser, B. Eur. pts. xxv., xxvii., xxviii., xxx., xxxi.

Erythacus hyrcanus, sp. n., Southern Shores of Caspian Sea; W. T. Blanford, Ibis, 1874, p. 79.

Daulias hafizi [Severtz. Turkest. Jevotn. p. 120] described; *id. tom. cit.* p. 80.

Ruticilla. Notes on Asiatic species of; *id. tom. cit.* pp. 79 & 80. *R. phenicura* and *R. titys* figured; H. E. Dresser, B. Eur. pts. xxvi., xxx.

Cyanecula wolfs and *C. suecica* figured; *id. t. c.* pts. xxvi. & xxvii.

Aedon familiaris and *A. galactodes* figured; *id. t. c.* pt. xxxii.

Sylvia orphea, *S. rueppelli*, *S. nisoria*, and *S. melanocephala*, figured; *id. t. c.* pts. xxx., xxxiii. *S. nana* figured; J. Gould, B. of Asia, pt. xxvi. *S. rubescens*, sp. n., Persia; W. T. Blanford, Ibis, 1874, p. 77.

Curruca affinis and *C. garrula*, in India; W. E. Brooks, Str. Feath. ii. p. 332.

Accentor dahuricus, sp. n., Dauria; L. Taczanowski, J. f. O. 1874, pp. 320 & 321.

Stiphornis albiternata, sp. n., Cameroons; A. Reichenow, J. f. O. 1874, p. 103.

Camaroptera olivacea, Sund., and *C. brevicaudata* (Rüpp.); J. H. Gurney, Ibis, 1874, pp. 94-96.

Stoliczka, g. n., type *S. stoliczkae* [!], sp. n., Yarkand; A. O. Hume, Str. Feath. ii. pp. 513 & 514 [= *Leptopacile sophia*, Sev.; Zool. Rec. x. p. 61].

Malurus albicapulatus, sp. n., New Guinea; A. B. Meyer, SB. Ak. Wien, lxi. 1, pp. 496 & 497.

Melizophilus striatus (Zool. Rec. ix. p. 49) = *Drymæca inquieta*, Rüpp.; W. T. Blanford, Ibis, 1874, p. 76.

Prinia rufula, Nágá Hills, and *Cisticola munipurensis*, Munipúr Valley, spp. nn.; H. H. Godwin-Austen, P. Z. S. 1874, p. 47. Figured; *id.* J. A. S. B. (n.s.) xliii. pt. 2, pl. ix.

Prinia superciliaris, sp. n., Borneo; T. Salvadori, Ann. Mus. Genov. v. p. 249.

Cisticola ruficollis = *C. melanocephala*, Anderson [Zool. Rec. viii. p. 62], figured; *id. tom. cit.* pl. ix. fig. 1.

Nymphæus, g. n., type *N. fuliginosus* (Vigors); A. O. Hume, Nests, &c., Ind. B. ii. p. 322.

Drymoipus rufescens and *D. jerdoni*, notes on; A. O. Hume, Str. Feath. ii. pp. 453 & 454.

Suya obscura, sp. n., Cashmere; *id. tom. cit.* p. 507.

Orthotomus nitidus, Tenasserim, *id. t. c.* pp. 507 & 508; *O. borneensis*, Borneo, Salvadori, Ann. Mus. Genov. v. p. 247: spp. nn.

Cettia stoliczkae, sp. n., Yarkand; Hume, *t. c.* pp. 520 & 521.

Hypolais olivetorum, *H. opaca*, *H. icterina*, *H. languida*, *H. pallida*, and *H. polyglotta* figured; H. E. Dresser, B. Eur. pts. xxvii., xxviii., & xxxi.

Hypolais rama distinct from *H. caligata*; W. E. Brooks, Ibis, 1874, pp. 184 & 185. [Cf. also W. T. Blanford, *t. c.* p. 300.] Nest and eggs figured; H. E. Dresser, P. Z. S. 1874, pp. 655 & 656, pl. lxxix.

Hypolais upcheri (Tristr.) = *H. languida* (H. & E.); W. T. Blanford, Ibis, 1874, p. 78.

Hypolais caligata and its allies; *id. t. c.* pp. 78 & 79.

Acrocephalus brunnescens, Jerd., = *A. stentorius* (H. & E.); *id. tom. cit.* p. 79.

Acrocephalus sogdianensis, sp. n., Turkestan; H. E. Dresser, *tom. cit.* pp. 420-422.

Calamodyta bistrigiceps, Swinh., = *Salicaria maacki*, Schrenck; R. Swinhoe, *tom. cit.* p. 183.

Locustella subsignata [Zool. Rec. x. p. 59] = *L. lanceolata* (Temm.); Ld. Walden, *tom. cit.* p. 139.

Locustella subcerthiola, sp. n., Hakodadi; R. Swinhoe, *tom. cit.* p. 154.

Locustella naevia, *L. fluviatilis*, and *L. lanceolata* figured; H. E. Dresser, B. Eur. pts. xxxi. & xxxiv.

Phyllopneuste borealis and *P. magnirostris*; W. E. Brooks, Ibis, 1874, pp. 459-461.

Phylloscopus superciliosus figured; H. E. Dresser, B. Eur. pt. xxx.

Phylloscopus brooksi, sp. n., Tenasserim; A. O. Hume, Str. Feath. ii. pp. 505 & 506.

Regulus ignicapillus, *R. cristatus*, and *R. maderensis* figured; H. E. Dresser, B. Eur. pts. xxix. & xxx.

Reguloides fulviventris, sp. n., Assam; H. H. Godwin-Austen, J. A. S. B. (n.s.) xliii. pt. 2, p. 167.

Abornis armandi [Zool. Rec. ii. p. 115] = *Sylvia schwarzi*, Radde, the type of *Oreopneuste*, Swinh. P. Z. S. 1871, p. 535; R. Swinhoe, Ibis, 1874, p. 183.

Gerygone affinis, New Guinea, *G. maforensis*, Mafoor, spp. nn.; A. B. Meyer, SB. Ak. Wien, lxx. 1, pp. 117-120.

MOTACILLIDÆ.

Anthus cervinus, *A. spinoletta*, *A. richardi*, *A. campestris*, *A. trivialis*,

A. pratensis, and *A. bertheloti* figured ; H. E. Dresser, B. Eur. pts. xxv.-xxvii.

Anthus brevirostris and *A. calcaratus*, spp. nn., Central Peru ; L. Taczanowski, P. Z. S. 1874, pp. 507 & 508.

Anthus pallescens, sp. n., Damara Land ; J. V. Barboza du Bocage, J. Sc. Lisb. 1874, pp. 52 & 53.

Motacilla cashmeriensis [Zool. Rec. viii. p. 62] = *M. personata*, Gould ; W. E. Brooks, Str. Feath. ii. p. 456.

Motacilla yarrelli, Gould, should stand as the true *M. lugubris*, Temm. ; A. Newton, 4th ed. Yarr. Brit. B.-pt. vi.

TROGLODYTIDÆ.

Troglodytes punctatus, Blyth (*nec* Brehm), is re-named *formosus* ; Ld. Walden, Ibis, 1874, p. 91.

Cistothorus graminicola and *Thryothorus cantator*, spp. nn., Central Peru ; L. Taczanowski, P. Z. S. 1874, p. 130.

Thryothorus petenicus, Salv., = *T. albinucha*, Cabot ; O. Salvin, Ibis, 1874, p. 326.

Catherpes mexicanus, var. n. *conspersus*, Central North America ; R. Ridgway, B. N. Am. i. p. 139.

CERTHIIDÆ.

Certhia familiaris figured ; H. E. Dresser, B. Eur. pt. xxix.

SITTIDÆ.

Sitta nagaensis, sp. n., Nágá Hills ; H. H. Godwin-Austen, P. Z. S. 1874, p. 44. Figured ; *id.* J. A. S. B. (n.s.) xliii. pt. 2, pl. iv.

PARIDÆ.

Scheniparus, g. n., type *Proparus dubius*, sp. n. (Hume, J. A. S. B. (n.s.) xliii. pt. 2, p. 107), Tenasserim ; A. O. Hume, Str. Feath. ii. pp. 447-449.

Ægithalus stoliczkae, sp. n., Yarkand ; *id.* *tom. cit.* pp. 521 & 522.

Ægithalus consobrinus [Zool. Rec. viii. p. 54] figured ; J. Gould, B. of Asia, pt. xxvi.

Ægithalus pendulinus in North Germany ; A. E. Brehm, J. f. O. 1874, pp. 108 & 109.

TANAGRIDÆ.

DUBOIS, A. Remarques sur la variabilité de certaines espèces du genre *Calliste*. Bull. Ac. Belg. (2) xxxviii. pp. 124-129.

Remarks on supposed doubtful species of the genus.

Microspingus trifasciatus, g. & sp. nn. (pl. xix. fig. 1), Central Peru ; L. Taczanowski, P. Z. S. 1874, p. 132.

Buarremon atricapillus, sp. n., Bogotá [?]; G. N. Lawrence, Ann. Lyc. N. York, x. p. 396.

Buarremon gutturalis (Lafr.), its synonymy rectified; O. Salvin, Ibis, 1874, p. 322.

Buarremon mystacalis and *B. tricolor*, spp. nn., Central Peru; L. Taczanowski, P. Z. S. 1874, pp. 515 & 516. The latter figured (pl. lxxv.).

Phenicotherapis cristata, sp. n., Bogotá; G. N. Lawrence, Ann. Lyc. N. York, xi. pp. 70 & 71.

Chlorospingus brunneus and *C. axillaris*, spp. nn., Costa Rica; *id. t. c.* pp. 395 & 396. The latter = *Tachyphonus nitidissimus*, Salv., ♂ juv.; O. Salvin, Ibis, 1874, p. 308.

Chlorospingus cinereocephalus and *chrysogaster*, spp. nn., Central Peru; L. Taczanowski, P. Z. S. 1874, pp. 132 & 517.

Arrhemon rufidorsalis [Zool. Rec. ii. p. 117] = *A. aurantirostris*, var.; O. Salvin, Ibis, 1874, p. 308.

Iridornis jelskii [Zool. Rec. x. p. 62] figured; J. Cabanis, J. f. O. 1874, pl. ii. fig. 1.

ICTERIDÆ.

DUBOIS, A. Remarques morphologiques sur les espèces du sous-genre *Xanthoura*. Bull. Ac. Belg. (2) xxxviii. p. 406 (Title only).

PLOCEIDÆ.

Ploceus baya. Its habits in Ceylon; W. V. Legge, P. R. Soc. Tasm. 1874, p. 30.

FRINGILLIDÆ.

Pyrrhula orientalis and *P. cassini*; R. Swinhoe, Ibis, 1874, pp. 463 & 464.

Pyrrhula coccinea and *P. cineracea* in East Siberia. Full account, with a figure of the latter; B. Dybowski, J. f. O. 1874, pp. 39-46, pl. i.

Pyrrhula erythaca from Darjiling; A. O. Hume, Str. Feath. ii. p. 455.

Pinicola enucleator figured; H. E. Dresser, B. Eur. pt. xxxiv.

Cardinalis virginianus, var. n. *coccineus*, W. Mexico; R. Ridgway, N. A. Birds, ii. p. 79.

Pycnorhamphus, g. n., type *P. icteroides* (Vigors); A. O. Hume, Nests, &c., Ind. B. ii. p. 469.

Ægiothus flavirostris, var. n. *brewsteri*, Massachusetts; R. Ridgway, N. A. Birds, i. p. 501.

Leucosticte tephrocotis, var. n. *australis*; E. Coues, B. N. West, p. 111 (ex. Allen MSS.).

Propasser ambiguus [India], pp. 326-328, *P. stoliczkae*, Yarkand, p. 523, spp. nn., A. O. Hume, Str. Feath. ii.

Pytelia reichenovi, sp. n., Cameroons; G. Hartlaub, Ibis, 1874, p. 166.

Cyanospiza rosita, sp. n., Tehuantepec; G. N. Lawrence, Ann. Lyc. N. York, x. pp. 397 & 398.

Carduelis elegans. A complete account of its life-history ; N. Quessart, Paris : 1874, 8vo.

Munia. Notes on species of ; Ld. Walden, Ibis, 1874, pp. 144 & 145.

Munia subundulata, sp. n., Munipúr Valley ; H. H. Godwin-Austen, P. Z. S. 1874, p. 48.

Munia pectoralis re-named *jerdoni* ; A. O. Hume, Nests, &c. Ind. B. ii. p. 448.

Munia superstriata, sp. n., Tenasserim ; Str. Feath. ii. p. 481.

Sporophila eulérii, sp. n., Cantagallo ; J. Cabanis, J. f. O. 1874, p. 84.

Spermophila obscura, sp. n., Central Peru ; L. Taczanowski, P. Z. S. 1874, p. 519. *S. simplex* and *Lycalis raimondii*, spp. nn. ; *id. t. c.* pp. 132 & 133. Habits of *S. simplex* ; W. Nation, P. Z. S. 1874, p. 329.

Passer stoliczkae, sp. n., Yarkand ; A. O. Hume, Str. Feath. ii. pp. 516-518 (= *P. ammodendri*, Severtz. ; *id. t. c.* p. 536).

Petronia brevirostris, sp. n., Dauria ; L. Taczanowski, J. f. O. 1874, pp. 323 & 324.

Phonipara fumosa, sp. n., Trinidad ; G. N. Lawrence, Ann. Lyc. N. York, x. pp. 396 & 397.

Coturniculus passerinus, var. n. *perpallidus*, Western United States ; R. Ridgway, N. A. Birds, i. p. 556.

Melospiza melodia, var. n. *mexicana*, Mexico ; *id. op. cit.* ii. p. 18.

Peucea æstivalis, var. n. *arizonæ*, Arizona ; *id. tom. cit.* p. 41.

Zonotrichia leucophrys, var. n. *intermedia* ; E. Coues, B. N. West, p. 156.

EMBERIZIDÆ.

Schenicola yessoensis, sp. n., Japan ; R. Swinhoe, Ibis, 1874, p. 161.

Emberiza godlewskii, sp. n., Dauria ; L. Taczanowski, J. f. O. 1874, pp. 330 & 331.

Emberiza cernutii, Filippi [Zool. Rec. ii. p. 119], = *E. huttoni*, Blyth ; W. T. Blanford, Ibis, 1874, p. 81.

Amphispiza, g. n., type, *A. bilineata* (Cass.) ; E. Coues, B. N. West, p. 234.

Junco hyemalis, var. n. *aikeni*, Colorado ; R. Ridgway, N. A. Birds, i. p. 584.

Poospiza belli, var. n. *nevadensis*, Middle United States ; *id. tom. cit.* p. 594.

Pipilo chlorosoma, Mexico, and *P. carmani*, Sorocco Islands, S. F. Baird, N. A. Birds, ii. pp. 108 & 109 ; *P. mystacalis*, Central Peru, L. Taczanowski, P. Z. S. 1874, p. 521 : spp. nn.

ALAUDIDÆ.

SHARPE, R. B. A study of the Larks of South Africa. P. Z. S. 1874, pp. 614-651, pls. lxxv. & lxxvi.

9 genera and 22 species recognized from South Africa. A revision of the genera of the family *Alaudidæ* is given (pp. 614 & 615), full descriptions and synonymy of the South African species being added.

Certhilauda rufula is distinct from *C. garrula*; *id. tom. cit.* pp. 618 & 619.

Heterocorys, g. n., type, *H. breviunguis* (Sund.); *id. t. c.* pp. 625 & 626, pl. lxxvi. fig. 1.

Ammomanes grayi (Wahlberg) figured; *id. t. c.* pl. lxxvi. fig. 2.

Tephrocorys, g. n., type, *T. cinerea* (Gm.); *id. t. c.* p. 633.

Mirafr fringillaris (Sund.) figured; *id. t. c.* pl. lxxv. fig. 1. *M. damarensis*, sp. n., *id. t. c.* p. 650, pl. lxxv. fig. 2.

Certhilauda desertorum, *Otocorys penicillata*, *O. alpestris*, *O. bilopha*, and *Ammomanes deserti*, figured; H. E. Dresser, B. Eur. pts. xxxii.-xxxiv.

Megalophonus erythrochlamys, Strickl., and *Alauda conirostris*, Sund., figured; T. Ayres, Ibis, 1874, pl. iii.

Otocorys alpestris, var. n. *leucolæma*, Dakota; E. Coues, B. N. West, p. 39.

STURNIDÆ.

HARTLAUB, G. Die Glanzstaare Afrika's monographisch bearbeitet. Abh. Ver. Brem. iv. pp. 35-98.

A complete monograph of the African Glossy-Starlings, which the author arranges under the following genera: - *Lamprotornis* (5 species), *Lamprocolius* (17 species), *Pholidauges* (2 species), *Notauges* (4 species), *Onycognathus* (2 species), *Amydrus* (4 species), *Pilorhinus* (1 species), *Pyrrhocheira* (1 species), and *Oligomydrus* (1 species).

This work is reviewed by J. V. Barboza du Bocage; J. Sc. Lisb. 1874, pp. 61-64.

Lamprocolius porphyrrurus, sp. n., Gold Coast; Hartlaub, *t. c.* pp. 60 & 61.

Fregilupus varius is shown to have its closest affinities with this family, and to be in proximity to *Pastor*, though distinctively characterized; J. Murie, P. Z. S. 1874, pp. 474-488, pls. lxi. & lxii. [see "ANATOMY AND PHYSIOLOGY"]. A succinct historical summary of the literature concerning this bird and its synonymy is given.

Sturnus unicolor and *S. vulgaris* figured; H. E. Dresser, B. Eur. pts. xxvi., xxvii., xxx.

Amydrus reichenovi, sp. n., W. Africa; J. Cabanis, J. f. O. 1874, p. 232.

Sturnopastor leucopterus, sp. n., Burmah; A. O. Hume, Str. Feath. ii. p. 480.

ARTAMIDÆ.

Artamus maximus, sp. n., Arfak Mountains, New Guinea; A. B. Meyer, SB. Ak. Wien, lxi. 1, pp. 203 & 204.

ICTERIDÆ.

Molothrus bonariensis, *M. badius*, and *M. rufoaxillaris*. Peculiarities

in habits noted by W. H. Hudson, P. Z. S. 1874, pp. 153-174, who more particularly dwells on their instincts, nidification, and parasitism [*vide* "GENERAL SUBJECT"].

Agelaius longirostris, sp. n., Western Mexico; T. Salvadori, Atti Acc. Tor. ix. pp. 632 & 633.

Centropsar mirus, g. & sp. nn., W. Mexico; P. L. Sclater, P. Z. S. 1874, pp. 175 & 176, pl. xxvi. [*Avis* fict., *id. op. cit.* 1875, p. 380].

PARADISIIDÆ.

Epimachus wilhelminæ, sp. n., New Guinea, A. B. Meyer, Nat. Tids. 1873, pp. 415 & 416; = *Drepanornis albertisi* [Zool. Rec. x. p. 65], O. Finsch, J. f. O. 1874, p. 54, A. B. Meyer, *t. c.* p. 55.

Elurædus arfakianus, sp. n., Arfak Mountains, New Guinea; A. B. Meyer, SB. Ak. Wien, lxix. 1, pp. 82 & 83.

Elurædus maculosus, sp. n., Queensland; E. P. Ramsay, P. Z. S. 1874, p. 601.

Chlamydodera maculosa. On its egg: *id. t. c.* p. 605.

CORVIDÆ.

Corvus tingitanus, sp. n., Tangier; L. H. Irby, Ibis, 1874, pp. 264-266.

Corvus corone, *C. cornix*, *Nucifraga caryocatactes*, and *Cyanopica cooki*, figured; H. E. Dresser, B. Eur. pts. xxvi. & xxviii.

Corvus corone and *C. cornix*, though confounded by many, are, from a study of the microscopic structure of the egg-shells, regarded as distinct species. Moreover, where they apparently interbreed, the bastard or hybrid can be detected from the relative sizes of the mammillæ of the egg-shell. W. von Nathusius, J. f. O. (4) 1874, ii. pp. 1-26. [See "OOLOGY."]

Pyrrhocorax forsythi, sp. n., Cashmere; F. Stoliczka, Str. Feath. ii. p. 463 (? = *P. alpinus*, juv.; A. O. Hume, *tom. cit.* p. 463).

Podoces biddulphi, sp. n., Yarkand; A. O. Hume, *tom. cit.* pp. 503-505, 529. *P. humilis* [Zool. Rec. viii. p. 63], from Thibet; L. Mandelli, *tom. cit.* p. 455.

Gymnocorvus senex, from New Guinea and Jobi; A. B. Meyer, SB. Ak. Wien, lxix. 1, p. 396.

Picathartes gymnocephalus. Ad., juv., and egg figured; H. T. Ussher, Ibis, 1874, pl. ii.

Dendrocitta baylii, Tytler, figured; Ld. Walden, Ibis, 1874, pl. vi.

Garrulus leucotis, sp. n., Tenasserim; A. O. Hume, Str. Feath. ii. pp. 443 & 444; *id.* J. A. S. B. (n. s.) xliii. pt. 2, p. 106.

Perisoreus canadensis, var. n. *obscurus*, British Columbia; R. Ridgway, B. N. Am. p. 302. Var. n. *capitalis*, United States; S. F. Baird, *tom. cit.* p. 302.

Cyanocitta argentigula, sp. n., Costa Rica; G. N. Lawrence, Ann. Lyc. N. York, xi. pp. 88 & 89. *C. ultramarina*, varr. nn. *arizonæ*, Arizona, *sumichrasti*, Mexico; R. Ridgway, B. N. Amer. ii. pp. 283 & 284.

Cyanura stelleri, var. n. *frontalis*, California; *id. t. c.* p. 279.

COLUMBÆ.

GARROD, A. H. On some points in the Anatomy of the Columbæ. P. Z. S. 1874, pp. 249-259.

Differences in the number of the rectrices, the presence or absence of an oil gland, cæca, and ambiens muscle, form the basis of the author's classification of the Pigeons. Seven combinations of these structure are indicated. The Sand Grouse he regards as intimately related to, and a family of the Pigeons, as deduced from skeletal and muscular structures, irrespective of their long and voluminous cæcal appendages. An ancestral pigeon is assumed, whence the derivative stocks with their peculiarities. The most typical and least modified genera are *Columba*, *Turtur*, *Ectopistes*, and *Macropygia*, together with the family *Pteroclidæ*: the latter, however, branching off in another direction. The subjoined classification is offered:—

Sub-Ord. COLUMBÆ. Schizorhinal birds with a characteristic pterylosis, humerus head, and sternum, and the 4th gluteal muscle undeveloped; when present, a nude oil gland; gall bladder generally absent.

Fam. COLUMBIDÆ. Cæca never exceeding half an inch in length.

Sub-fam. COLUMBINÆ. Have an ambiens muscle, cæca, and oil gland; no gall bladder; 12 rectrices. *Columba*, *Turtur*, *Macropygia*, *Ectopistes*.

Sub-fam. PHAPINÆ. With an ambiens muscle, but no cæca.

Div. α. Oil gland present, no gall bladder. *Chamapelia*, *Metriopelia*, *Zenaida*, *Zenaidura* (American), and *Calenas*, *Chalcopectia*, *Tympanistria*, *Ocyphaps*, *Leucosaria*, and *Phaps* (Old World).

Div. β. Oil gland and gall bladder present. *Carpophaga*.

Div. γ. Accessory femoro-caudal muscle absent; oil gland and gall bladder present. *Lopholæmus*.

Div. δ. Oil gland and gall bladder absent. *Didunculus*.

Sub-fam. TRERONINÆ. Wanting the ambiens muscle.

Div. α. With cæca and oil gland, but no gall bladder. *Phlogoenas*.

Div. β. With cæca; without gall bladder and oil gland. *Starnænas*.

Div. γ. With oil gland, but no cæca or gall bladder. *Geopelia*.

Div. δ. No cæca or oil gland (or very small one), and scutellated tarsi. *Treron*, *Ptilonopus*.

Div. ε. Neither cæca, oil gland, or gall bladder; tarsi reticulate. *Goura*.

Fam. PTEROCLIDÆ. *Columbæ*, with cæca exceeding half an inch long.

Sub-fam. PTEROCLINÆ. *Pteroclidæ*, with an ambiens muscle, a gall bladder, and oil gland. *Pterocles* and *Syrnhaptes*.

COLUMBIDÆ.

Columba rodericana, sp. n. (foss.), studied and named from a breast-bone obtained in the cavern débris of Rodriguez. The characters distinguishing this bone are based on the size and obliquity of the sternal laminae, form of the lateral notches, and large oblique coracoidian

gutters. These show points of affinity to *Erythræna*, *Turtur*, and *Vinago*. In size it apparently accords with *Columba tympanistra*, but was better formed for flight. A. Milne-Edwards, Ann. Sc. Nat. (5) 1874, p. 15, pl. xii.

Columba rupestris and *C. leuconota* figured; J. Gould, B. of Asia, pt. xxvi.

Ianthænas nicobarica, sp. n., Nicobars; Ld. Walden, Ann. N. H. (4) xiv. p. 157 (= *I. palumboides*; A. O. Hume, Str. Feath. ii. p. 498).

Carpophaga pulchella, sp. n., Togian Islands, Ld. Walden, l. c.

Ptilonopus huttoni, sp. n., Rapa Island; O. Finsch, P. Z. S. 1874, pp. 92-94.

Ptilonopus aurantiifrons (Gray), var. n.: *novæ-guinææ*, New Guinea; A. B. Meyer, SB. Ak. Wien, lxix. 1, pp. 508 & 509.

Ptilonopus rivoli and allies. Observations on specific value as affected by extremely restricted localities; *id. op. cit.* lxx. 1, pp. 128 & 129.

Lamprotreron porphyrostictus, sp. n., N. Queensland; J. Gould, Ann. N. H. (4) xiii. p. 137.

Macropygia turtur. Notes as to localities of the various forms associated by Schlegel (Mus. P. B. Columbæ, p. 110) under this name; A. B. Meyer, *op. cit.* lxix. 1, pp. 401 & 402.

Macropygia assimilis, sp. n., Tenasserim; A. O. Hume, Str. Feath. ii. pp. 441 & 442.

Turtur picturatus, referred to, and tarso-metatarsæ figured; A. Milne-Edwards, Ann. Sc. Nat. (5) xix. p. 14, pl. xii.

Turtur stoliczkaæ, sp. n., Kashgar; A. O. Hume, Str. Feath. ii. pp. 519 & 528.

Leptoptila riottii [Zool. Rec. v. p. 97] = *L. verreauxi*, and *L. bonapartii*, Lawr., = *L. plumbeiceps*; O. Salvin, Ibis, 1874, p. 312.

Geotrygon veraguensis [Zool. Rec. iii. p. 103] figured; O. Salvin, Ibis, 1874, pl. xii. *G. lawrencii*, sp. n., Veragua; *id. t. c.* p. 329. *G. rufiventris*, sp. n., Costa Rica; G. N. Lawrence, Ann. Lyc. N. York, xi. p. 90.

DIDIDÆ.

Didus. Letter on a living specimen shipped for England in 1628; A. Newton, P. Z. S. 1874, pp. 307, 447-449.

DIDUNCULIDÆ.

Didunculus strigirostris. On its habits; S. J. Whitmee, P. Z. S. 1874, pp. 183 & 184.

GALLINÆ.

CRACIDÆ.

Penelope ortonii, sp. n., W. Ecuador; O. Salvin, Ibis, 1874, pp. 325 & 326.

Penelope rufiventris, Tschudi, = *Ortalia goudoti*, Less.; *id. tom. cit.* p. 318.

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PTEROCLIDÆ.

Pterocles arenarius and *P. alchata* figured; H. E. Dresser, B. Eur. pt. xxxiii.

PHASIANIDÆ.

Lobiophasis, g. n., type *L. bulweri*, sp. n., Northern Borneo; R. B. Sharpe, Ann. N. H. (4) xiv. p. 373.

Phasianus chrysomelas, p. 207, River Amou-Darya, and *P. persicus*, p. 208, S. Caspian, spp. nn., N. Severtzow, Bull. Mosc. xlviii. pt. 2.

Lophophorus sclateri [Zool. Rec. vii. p. 59] fully described; A. O. Hume, Str. Feath. ii. pp. 488 & 489.

Calophasis elliotti [op. cit. ix. p. 54] and *Tetraophasis obscurus* [op. cit. viii. p. 70] figured; J. Gould, B. Asia, pt. xxvi.

THINOCHORIDÆ.

Thinocorus inca. Its eggs ally it to the Sand-grouse (*Pteroclidæ*); L. Taczanowski, P. Z. S. 1874, p. 556.

TETRAONIDÆ.

Lagopus rupestris, *L. albus*, and *L. mutus*, figured; H. E. Dresser, B. Eur. pts. xxviii., xxix., xxxi. & xxxii.

Lagopus leucurus, eggs of; T. M. Brewer, P. Bost. Soc. xvi. p. 348.

Lagopus hyperboreus (*hemileucurus*) and allies; C. J. Sundevall, Öfv. Ak. Förh. 1874, pp. 18-20.

Canace obscura, var. n. *fuliginosa*, N. W. America; R. Ridgway, N. A. Birds, iii. p. 425.

Cupidonia cupido, var. n. *pallidicinctus*, Texas; *id. t. c.* p. 446.

Arboricola. J. Wood-Mason records the presence of a supra-orbital bone in *A. torqueola*, *atrigularis*, *rufigularis*, and *intermedia*. J. A. S. B. (2) xliii. pt. 2, pp. 254 & 255, pl. ii.

Arborophila mandelli, sp. n., Bhotan Doars; A. O. Hume, Str. Feath. ii. pp. 449-451, J. A. S. B. (n.s.) xliii. pt. 2, p. 106.

Microperdix blewitti, sp. n., Raipoor; A. O. Hume, Str. Feath. ii. pp. 512 & 513.

Bambusicola hopkinsoni, sp. n., Shillong; H. H. Godwin-Austen, J. A. S. B. (n.s.) xliii. pt. 2, pp. 172 & 173.

TURNICIDÆ.

Hemipodius tachydromus, pull., figured; A. Marchand, R. Z. (3) ii. pl. xi.

MEGAPODIIDÆ.

Talegallus cuvieri, notes on; *T. jobiensis*, sp. n., Island of Jobi; A. B. Meyer, SB. Ak. Wien, lxix. 1, pp. 85-88.

Megapodius geelvinkianus, sp. n., Mafoor and Mysore Islands; *id. tom. cit.* pp. 88-91.

Megapodius reinwardti. Remarks on; *id. tom. cit.* pp. 214 & 215.

Megapodius trinkutensis, sp. n., Trinkut Island, Nicobars; R. B. Sharpe, *Ann. N. H.* (4) xiii. p. 448 (= *M. nicobariensis*, Walden, *op. cit.* xiv. p. 163; A. O. Hume, *Str. Feath.* ii. p. 499).

Megapodius. Eggs from the Solomon Islands and New Britain; J. Brazier, *P. Z. S.* 1874, p. 606: and from New Guinea; R. B. Sharpe, *tom. cit.* p. 607.

TINAMIDÆ.

Tinamus frantzii [*Zool. Rec.* v. p. 103] = *T. bonapartii*, Gray; O. Salvin, *Ibis*, 1874, p. 312.

Nothura major. Skeleton and muscles described; E. Alix, *J. Zool.* iii. pp. 167 & 252, pls. viii.-xi. The taxonomic conclusions are that the Tinamous are structurally related to the *Struthiones* and *Gallinæ*, showing fainter resemblances to the *Rallidæ*, and, by isolated traits, indicating remote affinities to the *Grallæ* and *Palmipedes*. The author is inclined to separate them as a group, and in this agrees with the later researches of systematists.

Nothoprocta branickii, Central Peru; L. Taczanowski, *P. Z. S.* 1874, p. 563; *N. taczanowskii*, Peru, P. L. Sclater & O. Salvin, *tom. cit.* p. 679: spp. nn.

GRALLÆ.

RALLIDÆ.

HUTTON, F. W. Notes on the New Zealand Wood Hens (*Ocydromus*). *Tr. N. Z. Inst.* vi. pp. 110-112.

The author recognizes six species, *O. hectori* and *O. finschi*, from Otago, being new.

R. RIDGWAY, *Am. Nat.* viii. pp. 108-111, in "Notes upon American Water-birds," remarks upon the parallelism between certain North American and European forms. He describes a new species and some new varieties, and indicates some changes in synonymy.

Erythromachus leguati, g. & sp. nn., from Caves of Rodriguez, considered to be the *Gellinote* of Leguat. Feet short ($\frac{1}{4}$ to $\frac{1}{2}$ less than in *Ocydromus*); three anterior toes well developed, the fourth (hallux) very small; body smaller than in *Ocydromus*, wings slightly better developed, but also incapable of flight; head small; beak red, straight, acutely tapering; orbit bordered with red; plumage of a clear grey. Food: worms, insects, and molluscs. It evidently shows relations to the extinct *Aphanapteryx* of Mauritius, but by the form of the beak and other particulars diverges and offers generic separation, whilst evidently allied to the *Ocydromidæ*. The tarsus, sternum, and portion of cranium are figured. A. Milne-Edwards, *Ann. Sci. Nat.* (5) xix. 1874, p. 6, pls. xi. & xii.

Pareudiastes pacificus [*Zool. Rec.* viii. p. 71]. On its habits; S. J. Whitmee, *P. Z. S.* 1874, pp. 184 & 185.

Gallicrex cristatus. Its eggs artificially hatched; J. R. Cripps, Str. Feath. ii. p. 531.

Porzana jamaicensis, var. n. *coturniculus*, Farallone Islands; R. Ridgway, Am. Nat. viii. p. 540.

Porzana cinereiceps, sp. n., Costa Rica; G. N. Lawrence, Ann. Lyc. N. York, xi. pp. 90 & 91.

Rallus elegans, var. n. *obsoletus*, California; R. Ridgway, Am. Nat. viii. p. 111.

Rallus dieffenbachi and *R. philippensis*. Heads figured; W. L. Buller, Tr. N. Z. Inst. vi. p. 125 (Ibis, 1874, p. 118).

Cabalus, g. n., type *Rallus modestus* [Zool. Rec. ix. p. 55]; F. W. Hutton, tom. cit. pp. 108–110: sternum figured, pl. xx.

SCOLOPACIDÆ.

BULLER, W. L. On the genus *Himantopus* in New Zealand. Tr. N. Z. Inst. vii. pp. 220–224.

3 species are recognized.

HARTING, J. E. On rare or little-known *Limicolæ*. The genus *Recurvirostra*. Ibis, 1874, pp. 241–261, pl. ix.

Monographs the *Avocets*, 4 species only of which are known. *R. andina*, Ph. & Landb., is figured.

Numenius subarquata, sp. n., Andamans; A. O. Hume, Str. Feath. ii. p. 297.

Tringa gracilis, sp. n., Alaska; J. E. Harting, P. Z. S. 1874, pp. 242 & 245, pl. xl. (= *T. pilocnemis*, Coues, Rep. Prybilow Isl. App.)

Terekia cinerea. On its egg; *id.* t. c. p. 454.

Phalaropus hyperboreus and *P. fulicarius* figured; H. E. Dresser, B. Eur. pts. xxxii. & xxxiii.

Gallinago andina, Central Peru; L. Taczanowski, P. Z. S. 1874, p. 561.

CHARADRIIDÆ.

Orthorhamphus, g. n.; type, *O. magnirostris* (Geoffr.). T. Salvadori, Ann. Mus. Genov. v. p. 312.

Ægialitis microrhynchus, sp. n., California, *Æ. melodus*, var. n. *circumcinctus*, between the Missouri and Rocky Mountains, *Æ. wilsonius*, var. n. *rufinucha*, Jamaica; R. Ridgway, Am. Nat. viii. p. 109.

Lobivanellus goensis, *L. lobatus*, *Hoplopterus ventralis* (pl. lx. fig. 3), *H. spinosus*, *Æsacus recurvirostris*, *Æ. grallarius*, *Æ. maculosus*, *Pluvianus ægyptius* (l. c. fig. 2), *Chætusia coronata*, *Ægialites pecuarius* (l. c. fig. 4), *Æ. tricoloris* (fig. 5), *Æ. falklandica* (fig. 6), *Æ. collaris* (fig. 7), *Æ. ruficapillus* (fig. 8) *Æ. nigrifrons* (fig. 9), *Vanellus cayennensis*, *Sarcophorus pectoralis*, *Himantopus leucocephalus*, *H. novæ-zealandiæ*, *Anarhynchus frontalis* (fig. 11). On their eggs; J. E. Harting, P. Z. S. 1874, pp. 455–460.

Vanellus villotæi breeding near Sarepta; J. Vian, R. Z. (3) ii. pp. 235–241.

Vanellus occidentalis, sp. n., Chili; J. E. Harting, P. Z. S. 1874, p. 451.
Glareola pratincola and *G. melanoptera* figured; H. E. Dresser, B. Eur. pt. xxix. On eggs of *G. melanoptera* and *G. lactea* (pl. lx. fig. 1); J. E. Harting, P. Z. S. 1874, pp. 454 & 455.

OTIDIDÆ.

Eupodotis australis and *Otis tarda*. Structural points concerning the so-called gular pouch have been observed by A. H. Garrod, P. Z. S. 1874, pp. 471-474, 673 & 674. [See "ANATOMY."].

Otis dybowskii, sp. n., Dauria; L. Taczanowski, J. f. O. 1874, pp. 331 & 332.

ARDEIDÆ.

Ardetta maculata in New Zealand; W. L. Buller, Tr. N. Z. Inst. vi. pp. 119-121, ♂ *ad.* and *juv.* figured, pl. xxi.

Ardea megacephala, sp. n., extinct, disinterred from the Rodriguez caverns. Skull, sternum, and some of the long bones of the extremities figured and described. With characters appertaining to the Herons, it has a much more massive cranium, relatively shorter feet, stout and larger legs, and a comparatively weak breast-bone, and is brevipennate. A. Milne-Edwards, Ann. Sci. Nat. (5) xix. p. 8, pl. xiv.

CICONIIDÆ.

Ciconia boyciana [Zool. Rec. x. p. 70] figured; P. L. Sclater, P. Z. S. 1874, pl. i. From Eastern Siberia; *id. tom. cit.* p. 306.

ANSERES.

PHENICOPTERIDÆ.

Phenicopterus minor. Flamingos visiting Mauritius and Reunion, and supposed to be *P. rubidus* or *P. erythræus*, are, in the opinion of Milne-Edwards, E. Newton, and Verreaux, to be referred to this species. Vinson observes that birds strangers to Mauritius and Reunion land on the coast towards Africa. Verreaux suggests that the Flamingoes in question came from Madagascar. A. Reynaud, Tr. R. Soc. Maur. viii. (1873) p. 4.

Phenicopterus, sp. n. ? (foss.). The osseous remains of a Flamingo brought from the Mauritius belong to a bird larger than *P. minor*, Geoff., and with greater resemblances to *P. erythræus*. A. Milne-Edwards, Ann. Sci. Nat. (5) xix. p. 27.

ANATIDÆ.

ANDERSON, A. On the nidification of certain Indian Birds. Part III. Ibis, 1874, pp. 220-223.

Describes the breeding of *Sarcidiornis melanonotus*, *Dendrocygna arcuata*, and *Nettapus coromandelanus*.

Cnemidornis calcitrans, Owen, is referred to the Lamellirostrate Natatores ; J. Hector, Tr. N. Z. Inst. vi. pp. 76-84 [*cf.* also P. Z. S. 1873 ; Ibis, 1874 ; and "ANATOMY AND PHYSIOLOGY," *antea*].

Strepsilas interpres. An arctic form, killed at the Black River in Mauritius. Tr. R. Soc. Maur. viii. (1873) p. v.

Anas obscura, var. *fulvigula*, Florida ; R. Ridgway, Am. Nat. viii. p. 111.

Mergus serrator and *M. albellus* figured ; H. E. Dresser, B. Eur. pts. xxxi.-xxxiv.

LARIDÆ.

COUES, E. Monograph of the North American *Laridæ*. Birds of the North West, pp. 588-717.

The whole of the internal anatomy and osteology is described, and exhaustive synonymy given. The author unfortunately reinstates Moehring's names of genera, in which he will scarcely be followed by ornithologists.

Larus phaeocephalus, Sw., is distinct from *L. cirrhocephalus* ; H. Saunders, P. Z. S. 1874, pp. 291-295.

Larus leucophæus from Mogador ; P. L. Sclater, Ibis, 1874, p. 100.

Larus ichthyæetus, pull., figured ; A. Marchand, R. Z. (3) ii. pl. xiii.

Xema sabinii figured ; H. E. Dresser, B. Eur. pt. xxxi.

Hydrochelidon nigra in Wisconsin ; E. Coues, B. N. West, p. 708.

Sterna alba. Note on ; W. L. Buller, Tr. N. Z. Inst. vii. p. 214.

Sterna leucoparia, *S. arctica*, *S. minuta*, *S. hirundo*, *S. nigra*. Heads of chicks figured ; A. Marchand, R. Z. (3) ii. pl. x. figs. 1-5.

Sterna frobeni, Phil. & Land., is distinct from *S. trudeaui*, Aud. ; L. Landbeck, Arch. f. Nat. xl. p. 112.

Sterna korustes, Andamans, A. O. Hume, Str. Feath. ii. p. 318 ; *S. portlandica*, Maine, R. Ridgway, Am. Nat. viii. p. 433 : spp. nn.

PROCELLARIIDÆ.

Thalassidroma pelagica and *T. leucorrhæa* figured ; H. E. Dresser, B. Eur. pt. xxvii.

Puffinus major in Norway ; R. Collett, J. f. O. 1874, p. 455.

Procellaria affinis, New Zealand, W. L. Buller, Tr. N. Z. Inst. vii. pp. 215 & 216, figs. 1-4 ; *P. aquitana* (foss.), A. Milne-Edwards, Bibl. H. Études, xi. art. v. : spp. nn.

Plotornis, g. n. (foss.), type *P. deltortrii*, sp. n. (foss.) ; A. Milne-Edwards, *loc. cit.*

Ossifraga alba, sp. n., New Zealand ; T. H. Potts, Tr. N. Z. Inst. vi. p. 152.

Sula pygmæa, sp. n. (foss.), A. Milne-Edwards, *loc. cit.*

PELECANIDÆ.

Plotus novæ-hollandæ in New Zealand ; W. L. Buller, Tr. N. Z. Inst. vii. pp. 217 & 218.

PODICIPIDIDÆ.

Podiceps minor. On its correct generic name; P. L. Sclater, Ibis, 1874, pp. 98 & 99.

SPHENISCIDÆ.

Aptenodytes patagonica is distinct from *A. forsteri*; A. Hyatt, P. Bost. Soc. xvii. p. 94.

Eudyptula albisignata, sp. n., New Zealand; O. Finsch, P. Z. S. 1874, pp. 207 & 208.

Dasyrhamphus herculis [Zool. Rec. vii. p. 64] = *D. adelix*; T. Salvadori, Atti Acc. Tor. ix. p. 635.

STRUTHIONES.

STRUTHIONIDÆ.

MIVART, ST. G. Memoir on the Axial Skeleton of the *Struthionidæ*. Preliminary notice. P. Z. S. 1874, p. 607; a short abstract of contents in Pop. Sci. Rev. 1874.

The general results indicated are:—that the Emu presents the least differentiated type, from which *Rhea* diverges most on the one hand, and *Apteryx* on the other; that the resemblance between *Dromæus* and *Casuaris* is exceedingly close; and that the axial skeleton of *Dinornis* is intermediate between that of *Casuaris* and *Apteryx*, its affinities, however, to the existing New Zealand forms very decidedly predominating.

Struthio camelus. A lengthened and minute description of the axial skeleton; St. G. Mivart, Tr. Z. S. viii. pp. 385–451, figs. 1–79. In domesticity; S. Wilson, P. R. Soc. Tasm. ii. pp. 205–232: R. Boulart, Bull. Soc. Acclim. (3) i. p. 433.

Dromæus, sp. ? (foss.). The distal end of the right tibia of a Struthionous bird discovered in the London Clay beds, bears a likeness to that of *Dromæus novæ-hollandiæ*. In size and other characteristics it is intermediate between the Emu and *Apteryx*. G. Seeley, Pop. Sci. Rev. 1874, p. 437.

Struthiolithus chersonensis, g. & sp. nn. (foss.); A. Brandt, Bull. Pétersb. xviii. p. 156; translated, Ibis, 1874, pp. 4–7.

CASUARIIDÆ.

SCLATER, P. L. On the Distribution of the species of Cassowaries. Rep. Br. Ass. 1874, p. 138.

Seven species are tabulated, and remarks as to their geographical range given. *Casuaris picticollis*, sp. n., from New Guinea, is shortly referred to.

Casuaris kaupi, Sclater [Zool. Rec. ix. p. 59], nec Rosenb., is renamed *westermanni*; P. L. Sclater, P. Z. S. 1874, pp. 247 & 248.

Casuaris australis in Queensland; E. P. Ramsay, P. Z. S. 1874, p. 325.

Casuaris sp. from New Guinea, remarks on ; A. B. Meyer, SB. Ak. Wien, lxix. 1, pp. 216-218.

DINORNITHIDÆ.

HAAST, JULIUS. Researches and excavations carried on in and near the Moa-bone Point Cave, Summer Road, in the year 1872. Christchurch, N. Z. : 1874. 8vo, pp. 1-22.

The bones discovered were those of Moas, and also of recent species.

— . Remarks on the extinct birds of New Zealand. *Ibis*, 1874, pp. 209-220.

Refers the allies of *Dinornis* to three separate genera, viz., *Palapteryx*, *Meionornis*, and *Euryapteryx*, the two latter being proposed for the first time. 11 species of these extinct gigantic birds are admitted.

Dinornis. . Remarks upon its footprints and recent extinction ; T. H. Cockburn-Hood, P. R. S. Edinb. viii. (1873-74) pp. 236-240.

Dromornis, sp. ? (foss.). No descriptive determination arrived at, but vertebral fragments of a bird evidently allied to *Dromornis* have been discovered. G. Krefft, *Geol. Mag.* 1874, p. 46.

Cnemionis calcitrans belongs to the *Natatores*. J. Hector, *Tr. N. Z. Inst.* vi. pp. 76-84, pls. x.-xiv.a.

APTERYGIDÆ.

Apteryx mollis and *A. fusca*, spp. nn., New Zealand ; T. H. Potts, *Zool.* (s. s.) 1874, pp. 4014 & 4015.

Apteryx haasti [*Zool. Rec.* ix. p. 60], notes on ; G. D. Rowley, *P. Z. S.* 1874, p. 498.

ODONTORNITHES.

ICHTHYORNITHES.

Odontopteryx toliapicus, g. & sp. nn. (foss.), from the London Clay ; R. Owen, *J. G. Soc.* xix. (1873), pp. 511-522, pls. xvi. & xvii. This remarkable pseudo-toothed bird, alike unique in certain cranial characters and mandibular bony denticles, is supposed to be most nearly allied to the Totipalmate and Lamellirostrate families of the *Natatores*, its precise affinity being, however, doubtful, on account of the imperfect condition of the only example known. While offering marked differences in its non-socketed teeth, it nevertheless temporarily may be ranged with Marsh's fossil genus *Ichthyornis* [*Zool. Rec.* x. p. 74], from the American Cretaceous strata. [See "ANATOMY."]

REPTILIA.

BY

A. W. E. O'SHAUGHNESSY.

ANATOMY.

ALIX, E. Sur la signification des os du bassin des Crocodiles. J. Zool. iii. pp. 17-20.

CALBERLA, ERNST. Studien über die Entwicklung der quergestreiften Muskeln und Nerven der Amphibien und Reptilien. Arch. mikr. Anat. xi. pp. 442-459, pls. xxiii. & xxiv.

GOETTE, A. Die Entwicklungsgeschichte der Unke (*Bombinator igneus*) als Grundlage einer vergleichenden Morphologie der Wirbelthiere. Leipzig: 1874-75, 8vo, pp. 964, atlas fol., 22 pls.

HERTWIG, OSCAR. Ueber das Zahnsystem der Amphibien und seine Bedeutung für die Genese des Skelets der Mundhöhle. Eine vergleichend anatomische, entwicklungsgeschichtliche Untersuchung. Arch. mikr. Anat. xi. Supplementheft, pp. 204, 5 plates.

KOLLMAN, J. Ueber den Einfluss des Wassers auf die rothen Blutkörperchen des Frosches. SB. bayer. Ak. iii. (1873) pp. 348-352.

MAN, J. Myologie comparée de l'extrémité postérieure chez les Amphibies. I. Amphibia caudata. II. Amphibia anura. Niederl. Arch. Zool. ii. pp. 53-87, pls. v. & vi.

SEELEY, H. Resemblances between the bones of typical living Reptiles and the bones of other animals. J. L. S. xii. pp. 155-195.

SOKOLOW, A. Sur les transformations des terminaisons des nerfs dans les muscles de la Grenouille après la section des nerfs. Arch. Phys. (2) i. pp. 300-315, pl. i. figs. 1-14.

STEINER, J. Zur Innervation des Froschherzens. Arch. Anat. Phys. 1874, pp. 474-490.

WATTEVILLE, ARMAND DE. Description of the cerebral and spinal nerves of *Rana esculenta*. J. Anat. Phys. (2) xv. pp. 145-162.

FAUNÆ.

Europe.

The systematic description of the Reptiles belonging to Italy, by E. DE BETTA, forms Part iv. fasc. 1 & 2 (pp. 1-107), of the work "L'Italia sotto l'aspetto fisico, storico, &c. II. Fauna d'Italia," Milano: 1874 [see Zool. Rec. ix. p. 83].

P. PAVESI enumerates and adds remarks on the Reptiles of the Cantone Ticino. Atti Soc. Ital. xvi. pp. 43-45.

VON MÖLLENDORFF establishes the Bosnian Reptile fauna as consisting of 2 Tortoises, 5 Lizards, 10 Snakes, and 11 Batrachians. Beiträge zur Fauna Bosniens; Gorlitz: 1873, 8vo, 73 pp. 1 pl.

Africa.

HANOTEAU & LETOURNEUX in "La Kabylie," Paris: 1873, vol. i. p. 160, give a short list of reptiles noticed by them in Kabylia.

O. BÖTTGER has monographed the Reptiles of Morocco and the Canary Islands in Abh. senck. Ges. ix. pp. 121-191, and also separately, Frankfurt a. M.: 1874, 4to, pp. 71, pl.

A. REICHENOW describes a collection of Reptiles made by himself and Dr. LÜHDER, characterizing one new genus and two new species of Frogs. Arch. f. Nat. 1874, pp. 287-298, pl. ix.

A. GÜNTHER describes Reptiles from the Camaroon Mountains. P. Z. S. 1874, pp. 442-445, pls. lvi. & lvii.

Persia and Baluchistan.

W. T. BLANFORD has published two papers describing new forms of Reptiles from these countries. Ann. N. H. (4) xiii. pp. 453-455, xiv. pp. 31-33.

Savage Island.

A. GÜNTHER describes 4 Lizards (1 new) and 1 snake (new) from this island. P. Z. S. 1874, pp. 295-297, pl. xlv.

New Guinea.

ADOLF MEYER communicates an account of a collection of Reptiles (57 species) from this island, Jobi, Mysore, and Mafoor, containing notices of several new species. MB. Ak. Berl. 1874, pp. 128-140.

America.

J. A. ALLEN's Notes on the Natural History of Montana and Dakota (P. Bost. Soc. xvii. pp. 68-70) show the Reptilia to be extremely scarce in those regions.

"Mission Scientifique au Mexique et dans l'Amérique Centrale." Sheets 15 to 24 of the 3rd part, devoted to Reptiles and Batrachians, by A. DUMÉRIL and F. BOCOURT, with plates xvi. to xviii. bis, have been published; they contain a continuation of the descriptions of *Iguanideæ*.

28 Reptiles collected by J. Bransford in Nicaragua, containing

many new species, are described by COPE ; P. Ac. Philad. 1874, pp. 64–72. A collection of Batrachians made by Professor Orton on the Upper Amazon, also containing several new species, described ; *id. tom. cit.* pp. 120–132.

CHELONIA.

Testudo pusilla, Shaw, plentiful in Morocco, re-described : Böttger, *Abh. senck. Ges.* ix. p. 123.

Emys grayi, Gthr. (*nec Str., nec Dum. & B.*), = *caspica*, Gm., *sec* Blanford, and is referred to *Clemmys* ; P. L. Slater, P. Z. S. 1873, p. 761. Var. *leprosa*, Schweigg, added to the fauna of Morocco, and re-described : Böttger, *l. c.* p. 126.

Clemmys (Heteroclemmys) gibbera, sub-g. & sp. nn. : Peters, MB. Ak. Berl. 1874, p. 622, pl. ii. Borneo.

(*Damonia*) *Clemmys unicolor*, Gray, is from Ningpo, not Shanghai ; P. L. Slater, P. Z. S. 1873, p. 517, note ; figured, *tom. cit.* pl. xlv.

Platemys novæ-guineæ, sp. n., Meyer, MB. Ak. Berl. 1874, p. 128, New Guinea.

Trionyx. THEOBALD gives his views as to the proper identification of the Indian and Burmese species, commenting on or correcting remarks by Dr. Gray, and describing *T. buchanani*, sp. n. (*T. hurum*, auctt. in pt.). P. A. S. B. 1874, pp. 75–86, pls. iii. & iv.

CROCODILIA.

Philas, sub-g. n., for *Crocodylus johnstoni*, Krefft ; noticed and figured : J. E. Gray, P. Z. S. 1874, p. 177, pl. xxvii.

Crocodylus madagascariensis, sp. n., *id. tom. cit.* p. 145, pl. xxiii. Madagascar.

RHYNCHOCEPHALIA.

PETERS, W. Ueber die Gehörknochelchen von *Hatteria punctata* und ihr verhältniss zu dem ersten Zungenbeinbogen. MB. Ak. Berl. 1874, pp. 40–45.

On the auditory ossicles of *Hatteria* and their relation to the first palatal arch.

SAURIA.

VARANIDE.

J. STACK notices disappearance of larger kinds of lizards from North Canterbury. Tr. N. Z. Inst. vii. p. 295.

Monitor doreanus, sp. n., Meyer, MB. Ak. Berl. 1874, p. 130, New Guinea, and *M. kordensis*, sp. n. *id. l. c.* p. 131, Mysore.

TEIIDÆ.

Ameiva edracantha, sp. n., Bocourt, Ann. Sci. Nat. (5) xix. art. 4, Western Coasts of North and South America.

Cnemidophorus nigricolor, sp. n., Peters, SB. nat. Fr. 1873, p. 76, Roques Islands, Venezuela.

LACERTIDÆ.

Zootoca lilfordi, sp. n., A. Günther, Ann. N. H. (4) xiv. p. 158, Filfolia Rock.

Lacerta princeps, Blanford, Ann. N. H. (4) xiv. p. 31, Southern Persia ; *L. carinata*, p. 368, fig. 1, Barawa, and *L. spinalis*, Peters, MB. Ak. Berl. 1874, p. 369, fig. 2, Bogos : spp. nn.

Tropidosaura algira, L., added to fauna of Morocco : Böttger, l. c. p. 129.

Acanthodactylus micropholis, sp. n., Blanford, Ann. N. H. (4) xiv. p. 33, Gedrosia.

Eremias persica and *E. fasciata*, spp. nn., *id.* l. c. pp. 31 & 32, Persia.

Eremias brenneri, Ptrs., var. n. *striatus*, Peters, MB. Ak. Berl. 1874, p. 370, Barawa.

Mesalina, distinguished by the character of its ventral shields rather than by that given by Gray ; *M. brevirostris*, from Tumb Island, Persian Gulf, and *M. pardaloides*, from Henjam Island, spp. nn. ; Blanford, Ann. N. H. (4) xiv. p. 32.

GYMNOPHTHALMIDÆ.

Günther separates *Ablepharus pœcilepleurus*, Wieg., from the Mauritian *A. boutoni*, Desjard., and describes *A. (Cryptoblepharus) 5-teniatus*, sp. n., West Coast of Africa. P. Z. S. 1874, p. 296.

Ablepharus pusillus, sp. n., Blanford, Ann. N. H. (4) xiv. p. 33, Basrah : = *Blepharosteres agilis*, Stol., = *A. brandti*, Str. ; *id.* tom. cit. p. 461.

Ablepharus (Morethia) teniopleurus, sp. n., Peters, MB. Ak. Berl. 1874, p. 375, Port Bowen.

CHALCIDIDÆ.

Propus, g. n. Scales smooth, in annuli, a lateral fold ; limbs, one pair, anterior, without digits or claws. A few pores at side of vent. Two internasals, one frontal, a narrow superciliary which descends in front of each eye, and a pair of parietals. Nostrils on suture between internasal and first labial ; a loreal shield. Tail elongate. *P. vermiformis*, sp. n., Cope, P. Ac. Philad. 1874, p. 70, Nauta, Peruvian Amazons.

CERCOSAURIDÆ.

Poroidogaster grayi, Sm., comes from Panama, not Lower California ; Peters, P. Z. S. 1874, p. 307.

SCINCIDÆ.

Lygosoma (Hinulia) jobiensis [-se], Jobi, *latifasciata* [-tum] and *minuta* [-tum], New Guinea, spp. nn.; Meyer, MB. Ak. Berl. 1874, pp. 131 & 132.

Lygosoma (Elania) muelleri, Schl., var. *n. jobiana* [-num]; Meyer, l. c. p. 132, Jobi.

Lygosoma (Carlia) novæ-guinææ, sp. n.; id. *ibid.* New Guinea.

Mococa lichenigera, Lord Howe's Island, *M. pretiosa*, Tasmania, *M. mustelina*, N. S. Wales, *M. microlepidota* and *M. metallica*, Van Diemen's Land, *M. pseudocarinata*, Tasmania, spp. nn.; A. W. E. O'Shaughnessy, Ann. N. H. (4) xiii. pp. 298-301.

Lygosoma (Mococa) reichenovii, sp. n., Peters, MB. Ak. Berl. 1874, p. 160, Camaroons; *L. (Mococa) africanum*, Gray, re-described, p. 162.

Lygosoma (Lipinia) aurea [-reum], sp. n.; Meyer, l. c. p. 132, Gobi.

Lygosoma punctulatum and *L. australe*, Gray, heads figured; Peters, MB. Ak. Berl. 1874, p. 374, figs. 5 & 7.

Heteropus tricarinatus, sp. n., and var. *striatus*; Meyer, l. c. p. 133, New Guinea.

Cophoscincus obscurus, sp. n., O'Shaughnessy, Ann. N. H. (4) xiv. p. 35, Queensland.

Eumeces uniformis, sp. n., Meyer, l. c. p. 133, New Guinea, Mafoor.

Cyclodus (Homolepida) nigricans, sp. n., Peters, *tom. cit.* p. 621, no locality given.

(*Plestiodon aldrovandi*) *Eumeces pavimentatus*, Geoff., re-described from Morocco; Böttger, Abh. senck. Ges. ix. p. 140.

Mabouya lawesi, sp. n., Günther, P. Z. S. 1874, p. 297, pl. xlv. A, Savage Island.

Euprepes (Mabouya) microstictus, p. 373, Pelew Islands, *parvisquamis*, p. 160, Samoa and Fiji Islands, and *virgatus*, p. 621, no locality given; Peters, MB. Ak. Berl. 1874: spp. nn.

Mabouya punctatissima, sp. n., O'Shaughnessy, Ann. N. H. (4) xiii. p. 300, Cape of Good Hope?

Euprepes (Mabouya) kordoanus, sp. n., Meyer, l. c. p. 133, Mysore.

Euprepes (Tiliqua) laviceps, sp. n., Peters, MB. Ak. Berl. 1874, p. 371, fig. 3, Barawa.

Euprepes hildebrandti, id. *tom. cit.* p. 372, fig. 4, Barawa; *E. fogoensis*, O'Shaughnessy, Ann. N. H. (4) xiii. p. 300, Cape Verde Islands: spp. nn.

Celestus bilobatus, sp. n., O'Shaughnessy, l. c. p. 257, Costa Rica.

Diploglossus (Celestus) variegatus, sp. n., Peters, l. c. p. 370, no locality given.

Diploglossus millepunctatus, sp. n., O'Shaughnessy, l. c. p. 301, West Coast of America.

SEPIDÆ.

Leps (Seps) mionecton, sp. n., Böttger, Abh. senck. Ges. ix. p. 145, fig. 6 (*S. viridanus*, Grav., Günth., pt.), Morocco.

Sepsina (Rhinoscincus) tetradactyla, subg. & sp. nn., Peters, l. c. p. 374, Zanzibar.

OPHIOMORIDÆ.

Zygnoptis, g. n., "affine *Ophiomori*, naribus inter duo scuta, alium supra, alium infra, supranasalibus contiguus, sed membris quatuor debilibus præditum." *Z. brevipes*, sp. n., Blanford, Ann. N. H. (4) xiv. p. 33, Karman.

GECKOTIDÆ.

Peripia mysorensis, sp. n., Meyer, MB. Ak. Berl. 1874, p. 129, Mysore.
Hemidactylus (*Peropus*) *brevipalmatus*, sp. n., Peters, *ibid.* p. 159, Pelew Islands.

Gehyra papuana, sp. n., Meyer, *l. c.* p. 129, New Guinea.

Pristurus rupestris, Blanford, Ann. N. H. (4) xiii. p. 454, Karrock Island and near Maskat.

Agamura, g. n. Geckotid: propter squamas digitosque ad *Gymnodactylum* accedens, dorso tuberculato, palpebris inferioribus nullis, pupilla verticali, dentibus numerosis æqualibusque, lingua antice brevissime fissâ; sed membris elongatis, cauda subcylindrica, valde flexibili, nunquam regenita, *Agamæ* simile. *A. cruralis*, sp. n., *id.* *l. c.* p. 455, Gedrosia.

Ceramodactylus, g. n. Digni ad latera fimbriati, subtus squamis parvis imbricatis in series obliquas ordinatis obtecti; caput corpusque squamis parvulis undique induta; crura longiuscula; palpebra inferior nulla. *C. doriae*, sp. n., *id.* *l. c.* p. 454, Bandar Abbas.

Gymnodactylus (*Heteronota*) *arfakianus*, sp. n., Meyer, *l. c.* p. 129, New Guinea.

Bunopus, g. n. (vel *Gymnodactyli*, subg.). Infradigital plates verrucose; digits not fringed. *B. tuberculatus*, sp. n., Blanford, *l. c.* p. 454, Persia.

Gymnodactylus brevipes and *G. heterocercus*, spp. nn., *id.* *l. c.* pp. 453 & 454, Baluchistan and West Persia. *G. trachyblepharus*, sp. n., Böttger, Abh. senck. Ges. p. 138, pl. i. fig. 3, and *G. mauritanicus*, D. & B., re-described, *id. tom. cit.* p. 17, Morocco.

IGUANIDÆ.

Polychrus marmoratus, Seba, *anomalous*, Wiegman, *multicarinatus*, Pet. The head and scales figured, Bocourt, Miss. Sc. Mèx. iii. pl. xvii. figs. 6, 7 & 8.

Laemactus longipes, Wiegman, and *L. serratus*, Cope, re-described, *id.* *l. c.* pp. 114-116; head of the former figured, pl. xviii. fig. 4.

Enyalus heterolepis, sp. n., *id.* Ann. Sc. Nat. (5) xix. Art. 4, Veragua.

Corythophanes cristatus, Seba, re-described, p. 118; *C. percarinatus*, Dum., p. 120, pl. xvii. fig. 10; and *C. mexicanus*, Hernand., p. 122, pl. xvii. fig. 1, re-described and the heads figured, Bocourt, Miss. Sc. Mèx. iii.

Basiliscus americanus, Seba, and *B. seemanni*, Gray, re-described, pp. 127-131; *B. vittatus*, Wiegman, re-described and head figured, p. 129, pl. xviii. fig. 3: *id.* *l. c.*

Ctenosaura completa, sp. n., p. 145, Guatemala and Union, Salvador; *C. acanthura*, Shaw, p. 138, *pectinata*, Wiegman, p. 140, *teres*, Harlan, 1825, p. 142 (= *C. armata*, Gray, 1831), and *cycluroides*, Wiegman, p. 143, re-described: *id. l. c.*

Anolis transfordi, Cope, P. Ac. Philad. 1874, p. 67, Nicaragua.

Sceloporus. A synoptical table of the genus, p. 170, and the following species re-described and figured:—*S. torquatus*, Green & Peale (*S. poinsettii*, Bd. & Gir.), p. 171, pl. xviii. fig. 9; *S. spinosus*, Wiegman, p. 174, pl. xviii. fig. 2) *S. thayeri*, Bd. & Gir., p. 176, pl. xviii. fig. 5; *S. horridus*, Wiegman, p. 178, pl. xviii. fig. 8; *S. formosus*, Wiegman, p. 182, pl. xviii. fig. 3; *S. gracilis*, Bd. & Gir., p. 190, pl. xviii. fig. 4; *S. grammicus*, Wiegman, p. 192, pl. xviii. bis, fig. 12. Figures given of *S. variabilis*, Wiegman, pl. xviii. bis, fig. 1; *S. humeralis*, sp. n., fig. 3 [Zool. Rec. x. p. 91]; *S. æneus*, Wiegman, fig. 4; *S. utiformis*, Cope, fig. 6; *S. squamosus*, sp. n., fig. 7; *S. fulvus*, sp. n., fig. 8; *S. scalaris*, Wiegman, fig. 9; *S. biserialatus*, Hallowell, fig. 10; *S. undulatus*, Bosc., fig. 11; *S. microlepidotus*, Wiegman, fig. 13: Bocourt, Miss. Sc. Méx. iii.

The following species are described as new:—*Sceloporus acanthinus*, p. 180, pl. xviii. fig. 10, pl. xix. fig. 4, Attitlan; *S. lunæi*, p. 184, pl. xviii. bis, fig. 5, Guatemala; *S. smaragdinus*, p. 186, pls. xviii. fig. 6, xix. fig. 1, Guatemala; *S. dugesi*, p. 188, pl. xviii. fig. 7, Colima; *id. l. c.* [Zool. Rec. x. p. 91]: *S. cupreus*, *id. Ann. Sc. Nat.* (5) xix. No. 4; Miss. Sc. Méx. iii. pl. xviii. bis, fig. 2, Oaxaca.

The following *Iguanidæ* are re-described and figured; *id. Miss. Sc. Méx. iii.*:—*Dipsosaurus dorsalis*, Bd. & Gir., p. 146, pl. xvii. fig. 5; *Cachryx defensor*, Cope, p. 148, pl. xvii. bis, fig. 12; *Sauromalus ater*, Dum., p. 149, pl. xvii. bis, fig. 11; *Liosaurus bellii*, D. & B., p. 152, pl. xvii. bis, fig. 3; *Crotaphytus collaris*, Say, p. 154, pl. xvii. bis, fig. 5; *Liosaurus hallowelli*, Dum. (= *C. wislizeni*, Bd. & Gir.), p. 155, pl. xvii. bis, fig. 4; *Callisaurus ventralis*, Bd. (= *C. draconoides*, Blainv.), p. 158, pl. xvii. fig. 10; *Holbrookia maculata*, Gir., p. 161, pl. xvii. bis, fig. 7; *Phymatolèpis bicarinata*, Dum., p. 165, pl. xvii. bis, fig. 9; *Batrachosoma asio*, Cope, head and scales figured, pl. xvii. fig. 9.

Holbrookia elegans, sp. n., Bocourt, *l. c.* p. 164, pl. xvii. bis, fig. 8, Mazatlan.

Uta auriculata, sp. n., Cope, P. Bost. Soc. xiv. p. 303, Socorro Island.

Phrynosoma coronatum. Notes on its myology by A. Sanders; P. Z. S. 1874, pp. 71–88, with woodcuts.

Phrynosoma taurus, sp. n., Dujés, Nat. Méx. ii. p. 302, Mexico.

AGAMIDÆ.

Gonyocephalus (Hypsilurus) nigrigularis, p. 129, New Guinea, *auritus*, New Guinea, and *binotatus* and *modestus*, Jobi, p. 130; Meyer, *l. c.*: spp. nn.

Stellio liratus and *microlepis*, spp. nn., Blanford, Ann. N. H. (4) xiii. p. 453, Baluchistan and Persia.

Agama cariniventris, sp. n., Peters, MB. Ak. Berl. 1874, p. 159, Zanzibar.

Agama colonorum, Daud., found in Morocco, re-described; Böttger, Abh. senck. Ges. ix. p. 132: also from Gold Coast, Reichenow, Arch. f. Nat. 1874, i. p. 295.

Uromastix microlepis, sp. n., Blanford, P. Z. S. 1874, pp. 656-660, pl. liii., Mesopotamia.

Centrotrachelus loricatus, sp. n., id. l. c. p. 660, Southern Persia.

CHAMÆLIONTIDÆ.

Chamæleon. Buchholtz makes general observations on the species inhabiting the Camaroon region, and on the changes of colour in the genus (MB. Ak. Berl. 1874, pp. 77-89 & 298-301), characterizing as new *C. spectrum*, pp. 81 & 298, figs. 5 & 6, and *C. montium*, p. 88, figs. 1-4 (described and figured by Günther. P. Z. S. 1874, p. 442, pl. lvi.), Camaroons.

Rampholeon, g. n., characterized by denticle at inner base of claw and spine on finger and toe, for *Chamæleon spectrum*, Buchh., described and figured by Günther, l. c. p. 443, pl. lvii.

OPHIDIA.

JAN, G., & SORDELLI, F. Iconographie générale des Ophidiens. 44^{me} livr. Paris: (August) 1873, 4to, 6 pls. (with 19 figures).

The above-mentioned part was also issued in 1873, being a continuation of the *Elapida*.

GENUS INCERTÆ SEDIS.

Gerrhosteus, g. n. Dentition opisthoglyph; neural spines supporting shield-like expansions, with a median groove, as in some genera of Batrachia. *G. prosopis*, sp. n., Cope, P. Ac. Philad. 1874, p. 71, Nauta, Peruvian Amazons.

TYPHLOPIDÆ.

Typhlops persicus, Blanford, Ann. N. H. (4) xiv. p. 34, Southern Persia; *T. conradi*, Peters, MB. Ak. Berl. 1874, p. 162, fig. 1, N. Celebes: spp. nn.

Onychocephalus (Letheobia) lumbriciformis, sp. n., Peters, l. c. p. 377, Zanzibar.

Onychocephalus kraussi, Jan. Colour described, from Gold Coast, Reichenow, Arch. f. Nat. 1874, i. p. 291.

CALAMARIDÆ.

Calamaria iris, sp. n., Böttger, Ber. Ver. Cass. xiii. (1873) & Ber. offenb. Ver. xiii. p. 38, with figure, Sumatra.

OLIGODONTIDÆ.

Simotes conradi, sp. n., Peters, l. c. p. 376, fig. 8, Bangkok.

TROPIDONOTIDÆ.

Tropidonotus tessellatus, Laur. (*T. hydrus*, Pall.). Note on 3 specimens of this species; Steindachner, Verh. z.-b. Wien, xxiv. p. 479.

Storeria, B. & G., is viviparous, like *Eutænia* and other *Tropidonotidæ*; Cope, P. Ac. Philad. 1874, p. 116.

COLUBRIDÆ.

Calamophis, subg. n.; type, *C. jobiensis*, sp. n., Meyer, MB. Ak. Berl. 1874, p. 135, Jobi.

Masticophis pulcherrimus, sp. n., Cope, l. c. p. 65, Western Central America.

HOMALOPIDÆ.

Helicops alleni, sp. n., Garman, P. Bost. Soc. xvii. p. 92, Florida.

PSAMMOPHIDÆ.

Celopeltis insignitus, Geoffr., re-described from Morocco; Böttger, Abh. senck. Ges. ix. p. 161.

DENDROPHIDÆ.

Hapsidrophis smaragdinus, Boié, and *Ahatulla irregularis*, Leach. Colours described, from Gold Coast; Reichenow, Arch. f. Nat. 1874, i. p. 292.

Dendrophis punctulatus, Gray, var. *atristriatus*; Meyer, l. c. p. 136, Jobi, Mysore.

DRYOPHIDÆ.

Cladophis kirtlandi, Dum. Colours described, from the Gaboon; Reichenow, l. c. p. 292.

DIPSADIDÆ.

Dipsas rhinopoma, sp. n., Blanford, Ann. N. H. (4) xiv. p. 34, Carmania.

AMBLYCEPHALIDÆ.

Leptognathus atypicus, sp. n., Cope, l. c. p. 65, Peruvian Andes.

LYCODONTIDÆ.

Bothrolycus, g. n. Family characters of *Lycodon*, with præocular pit of *Bothrophthalmus*. *B. ater*, sp. n., Günther, P. Z. S. 1874, p. 444, pl. lvii. B, Camaroons.

Heterolepis gueinzii, sp. n., Peters, MB. Ak. Berl. 1874, p. 163, fig. 2, Port Natal.

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G

Lycophidium elapoides, sp. n., Günther, P. Z. S. 1874, p. 444, Camaroons.

Lycodon magnus, p. 136, New Guinea, Mysore, and *L. parvus*, p. 137, New Guinea, Jobi; Meyer, l. c. spp. nn.

ELAPIDÆ.

Alecto labialis, Jan, *permixta*, Jan, *coronata*, Schl., *schmidtii*, Jan, *gouldi*, Gray, *dorsalis*, Jan (*Hoplocephalus nigristriatus*, Krefft), and *rhodogaster*, Jan, figured by Jan & Sordelli, Icon. Gén. Ophid. 44^e livr. 1873, pl. i. figs. 1-5, & pl. ii. figs. 1 & 2.

Bungarus semifasciatus, Kuhl, pl. ii. fig. 4, pl. iii. fig. 1; *B. cæruleus*, Schn., pl. iii. figs. 2 & 3: *iid. op. cit.*

Trimeresurus bungarus, Schl., pl. iv., *T. ikaheca*, Less., pl. v., and *T. porphyreus*, Merr. pl. vi. figured; *iid. op. cit.*

Aspidelaps lubricus, Laur., *scutatus*, Sundew. (*Naia fula-fula*, Bianc.), *hæmachates*, Lac., *lichtensteini*, Jan, figured; *iid. op. cit.* pl. vi. figs. 2-5.

Naia haje, L. Colours and habits, from Gold Coast and Camaroons; Reichenow, l. c. p. 293.

Naia tripudians. On the nature and physiological action of its poison, part ii. (continued from last year); T. Brunton & J. Fayrer, P. R. Soc. xxii. pp. 68-133.

VIPERIDÆ.

An account of two instances of the cures of Viper bites, by Feuvrier, C. R. lxxviii. p. 1793, and observations on the same subject by Oré, *tom. cit.* p. 983.

(*Clotho*) *Vipera arietans*, Merr., re-described from Morocco, with habits, &c., Böttger, Abh. senck. Ges. ix. p. 163; from Gold Coast, Reichenow, l. c. p. 294.

HYDRIDÆ.

Platurus schistorhynchus, sp. n., Günther, P. Z. S. 1874, p. 297, pl. xlv. A, Savage Island.

PYTHONIDÆ.

Chondropython, sub-g. n.; type, *C. azureus*, sp. n., Meyer, MB. Ak. Berl. 1874, p. 134, Mysore.

Aspidopython, sub-g. n.; type, *A. jakati*, sp. n., *id. tom. cit.* p. 135, New Guinea, Jobi.

PSEUDOPHIDIA.

Gymnopsis, g. n.; eyes not covered by skin, free, no ocular pits. Type, *G. multiplicata*, sp. n., Peters, MB. Ak. Berl. p. 616, pl. i. fig. 1, Veragua.

Cæcilia. By means of a specimen of *C. compressicauda* and young brought forth living at the time of capture, sent from Guiana by Wrzesniowski, with a communication from Jelski, W. Peters has been able to establish the viviparous nature of this animal, also that it has no

such lateral gill openings as have been found in *Epicrium glutinosum*, but a kind of external gills, resembling the campanuliform external gills of the larva of *Notodelphys ovifera*; that *allantois* and *amnios* are absent; and that for a portion of the year, water, and not mud, is the medium inhabited; *id. tom. cit.* pp. 46-49.

Siphonops brevirostris, sp. n., *id. tom. cit.* p. 617, pl. i. fig. 2, Guinea.

BATRACHIA.

HOFFMANN, C. K. Bronn's Klassen und Ordnungen des Thier-Reichs. vi. Abth. 2. Leipzig & Heidelberg [in progress].

Nos. 1 to 7 of the present section of this work, pp. 1-240, pls. i.-xvii., are occupied with the anatomy of the *Amphibia* in detail.

ROUGET, C. Observations sur le développement des nerfs périphériques chez les larves des Batraciens et des Salamandres. C. R. lxxix. pp. 306-309, 448-452.

BATRACHIA SALIENTIA.

E. Cornalia publishes further observations on *Pelobates fuscus* and *Rana agilis* in Atti Soc. Ital. xvi. pp. 96-106, pls. ii. & iii. Cf. also Moquin-Tandon, on the earlier phases of development of the former: C. R. lxxix. p. 132.

Rana esculenta, L., re-described from Morocco, Böttger, l. c. p. 165.

On the influence of light upon the development of the larvæ of frogs; J. B. Schnetzler, Bull. Soc. Vaud. (2) xiii. pp. 273-275.

Rana arfaki, sp. n., Meyer, l. c. p. 138, New Guinea.

Ranula brevipalmata and *R. nigrilatus*, spp. nn., Cope, P. Ac. Philad. 1874, p. 131, Nauta.

Bubonias, g. n. Fronto-parietals fully ossified, nasals separated. Xiphisternum an osseous style with disk. Auditory organs well developed. A large inguinal gland; no tarsal shovels or spurs. Maxillary, but no vomerine teeth. *B. plicifrons*, sp. n., *id. tom. cit.* p. 124, Nauta.

Cyclorhamphus æmaricus, sp. n., *id. tom. cit.* p. 125, Lake Titicaca.

Plectomantes rhodostima, sp. n., *id. tom. cit.* p. 127, Nauta.

Gnathophysa rubido, sp. n., *id. tom. cit.* p. 128, Moyabamba.

Atelopus seminiferus, sp. n., *id. tom. cit.* p. 130, Peru.

Bufo olivaceus, sp. n., Blanford, Ann. N. H. (4) xiv. p. 35, Gedrosia.

Limnodytes papuensis, sp. n., Meyer, l. c. p. 138, New Guinea, Jobi.

Rhacophorus madagascariensis, sp. n., Peters, l. c. p. 618, pl. i. fig. 3, Madagascar.

Hyperolius nigripunctatus, and *H. pygmaeus*, spp. nn., Meyer, l. c. p. 139, Jobi.

Polypedates crossleyi, sp. n., Peters, MB. Ak. Berl. 1874, p. 618, Madagascar.

Hylodes sulcatus, sp. n., Cope, P. Ac. Philad. 1874, p. 126, Nauta.

Litoria obtusirostris, sp. n., Meyer, l. c. p. 139, Jobi.

Hyla parvidens, Port Philip, and *H. calliscelis*, Adelaide, Peters, l. c. p. 620: spp. nn.

Hyla ebraccata, sp. n., Cope, P. Ac. Philad. 1874, p. 69, Nicaragua.

Pithecopus celestis, sp. n., *id. l. c.* p. 121, Moyabamba, Peru.

Osteocephalus planiceps, sp. n., Cope, *l. c.* p. 122, Nauta, Upper Amazons.

Scytotis funereus, Moyabamba, Peru, and *S. cryptacanthus*, Nauta, Cope, *l. c.* p. 123: spp. nn.

Petropedites, g. n. Agrees with *Platymantis* in the tongue and position of the palatine teeth, but has the disks of fingers and toes flattened out, and the toes webbed. *P. cameroonensis*, sp. n., Reichenow, Arch. f. Nat. 1874, i. p. 290, pl. ix. fig. ii. *a, b*, Bimbia, Camaroons.

Leptopelis rufus, sp. n., *id. l. c.* p. 291, pl. ix. fig. i. *a, b*, Camaroons.

Pelodryas dolichopsis, Cope, = *P. cærulea*, White; Meyer, *l. c.* p. 140.

Dendrobates ignitus, p. 68, Nicaragua, and *D. labialis*, p. 129, Nauta, Cope, *l. c.* spp. nn.

BATRACHIA GRADIENTIA.

ROBIN, C. Observations sur la fécondation des Urodèles. J. de l'Anat. Phys. 1874, pp. 376-390, pl. xv.

J. Schnetzler also publishes a note on the fecundation of Tritons as observed by him. Bull. Soc. Vaud. (2) xii. p. 440.

Triton ophryticus, Berth., a specimen in the Vienna Museum described by Steindachner, Verh. z.-b. Wien, xxiv. p. 480.

Ædipus altamazonicus, sp. n., Cope, P. Ac. Philad. 1874, p. 120, Upper Amazon.

Menobanchus lateralis. Skull and heart described: Huxley, P. Z. S. 1874, pp. 186-203, pls. xxix.-xxxii.

C. Dareste confirms the statement of Hernandez, contradicted by Cuvier, that the Axolotl has at the period of reproduction the cloaca filled with a special mucus of a red colour; C. R. lxxviii. p. 1656.

G. Malfatti gives an account of Axolotls bred in captivity; Atti Soc. Ital. xvi. pp. 141-147.

Amphiuma tridactyla. Note on its epidermis by Th. Studer; MT: Ges. Bern, 1874, p. 48.

PISCES.

BY

A. W. E. O'SHAUGHNESSY.

ANATOMY AND PHYSIOLOGY.

ALIX, É. Sur l'absence de véritables apophyses articulaires aux vertèbres des poissons osseux. *J. Zool.* iii. p. 20.

DUFOSSÉ, M. Recherches sur les bruits et les sons expressifs que font entendre les poissons d'Europe, et sur les organes producteurs de ces phénomènes acoustiques, ainsi que sur les appareils de l'audition de plusieurs de ces animaux. *Ann. Sc. Nat.* (5) xix. Art. 5, pp. 1-53, pls. xvi.-xix. and xx. Art. 3, pp. 1-134.

GÜNTHER, A. Description of a remarkable kind of air-bladder. *Ann. N. H.* (4) xiv. p. 349, pl. xviii.

HIS, —. Untersuchungen über das Ei und die Eientwicklung bei Knochenfischen. Leipzig: 1873, 4 pls.

MOREAU, A. Sur la vessie natatoire au point de vue de la station et de la locomotion du Poisson. *C. R.* lxxviii. pp. 541-544, 737-740. Further remarks on this organ, *op. cit.* lxxix. pp. 1134-1136, 1295-1299, & 1517.

VETTER, B. Untersuchungen zur vergleichenden Anatomie der Kiemen- und Kiefermusculatur der Fische. *Jen. Z. Nat.* viii. pp. 405-458, pls. xiv. & xv.

Observations on the morphology and development of fish scales by G. Winther, *Nat. Tids.* (3) viii. [1873] pp. 527-544, in *Perca fluviatilis*, pl. xvi. figs. 1-19, *Gobius*, pl. xvii. figs. 1-7, and *Platessa limanda*, pl. xvii. figs. 8-15.

The morphology and development of the ventral fins, and the structure of the pelvis and its muscles, are elaborately discussed and figured in detail by the same author, *op. cit.* ix. pp. 133-180, in *Trigla gurnardus*, pl. iv. *Cottus scorpio*, pl. v. figs. 1-7, *Agonus cataphractus*, pl. v. figs. 8-14, *Zoarces viviparus*, pl. v. figs. 15-26, and *Gobius niger*, pl. vi.

The structure and disposition of the papillæ bearing gustatory bulbs in *Gobius niger* are discussed and figured in detail; *id. tom. cit.* pp. 181-190, pl. vii.

THE GENERAL SUBJECT.

CHATELANAT, H. Note sur les migrations des poissons du Léman. Bull. Soc. Vaud. (2) xiii. pp. 36 & 37.

DOBSON, G. Notes on the respiration of some species of Indian fresh-water fishes. P. Z. S. 1874, pp. 312-320.

FOREL, F. Enquête sur l'épizootie de typhus qui a sévi sur les perches du lac Léman en 1873. Bull. Soc. Vaud. (2) xiii. pp. 400-411.

HOLDSWORTH, E. Deep-sea Fishing and Fishing-boats; an account of the practical working of fisheries in and around the British Islands. London: 1874, 8vo, pp. 430, pls.

POUCHET, G. Sur les couleurs des Poissons; Rapport sur une Mission scientifique aux viviers-laboratoires de Concarneau. Arch. Miss. Sci. (3) i. (1873), p. 535; and J. Zool. iii. pp. 105-123.

HOST, —. Observations on the fisheries of the Faroe Islands. Tids. Fisk. vii. pp. 97-125.

— & COLLIN, *tom. cit.* p. 126, on the Danish fisheries.

FAUNE.

Arctic.

In "Die zweite Deutsche Nordpolarfahrt in den Jahren 1869 & 1870" (Leipzig: 1874, royal 8vo), II. Zoologie, 1, pp. 169-174, PETERS gives descriptive notices of the fish obtained, *Cataphracti*, *Discoboli*, *Salmonini*, and *Gadini*, describing one new species of the latter group.

A list of 31 fishes hitherto known to inhabit the seas of Spitzbergen, the Bären Islands, and Nova Zembla, is given in "Reisen nach dem Nordpolarmeere in den Jahren 1870 und 1871," by Th. v. Heuglin (Braunschweig: 1874, 8vo), iii. Zoologie, pt. 3, Fische, pp. 203-228. The Rev. A. E. EATON also gives a list of the fishes observed by him in Spitzbergen; Zool. (s.s.) 1874, p. 3820.

North Atlantic.

A. GÜNTHER publishes notes on fishes obtained at considerable depths in the North Atlantic, giving the determination of the specimens, which were obtained during the voyage of the "Porcupine." Ann. N. H. (4) xiii. p. 138.

Europe.

R. COLLETT enumerates and characterizes the species of *Gobius* found in Norway, describing two as new. Ann. N. H. (4) xiii. p. 446, and Förh. Selsk. Chr. 1874, pp. 151-179, pl. iii. For Danish species, cf. WINTHER [*suprà*, p. 85].

LUNEL, G. Histoire Naturelle des Poissons du Bassin du Léman. Genève, Bâle, Lyon: 1874, fol. pp. 209, pls. xx.

The author establishes the existence of 22 species of fish in the waters of the Lake of Geneva, including the course of the Rhone and all affluents from the gorge of St. Maurice at the entrance of the Valais to the

western passage of the river between Crédoz and Mount Vuache. The author describes at length each species, giving the synonymy, elaborate measurements, and complete details of the habits, individual and sexual variations, parasites, and mode of capture, &c.: a coloured plate, with supplementary figures, accompanies each description.

North Africa.

HANOTEAU & LETOURNEUX in "La Kabylie" i. p. 161, mention a *Salar*, *Barbus callensis*, and *Anguilla vulgaris*, as inhabiting the fresh waters of Kabylia. *Clupea finta* and *Mugil cephalus* enter the rivers to the height of 40 kilometers.

GERVAIS, on fishes of the Algerian Sahara. C. R. lxxix. p. 557.

A. GÜNTHER describes 1 new species of *Serranus* and 3 of *Barbus* collected by Rein & Fritsch in Morocco. Ann. N. H. (4) xiii. pp. 230-232.

Turkestan.

KESSLER, in Nachr. Ges. Mosc. xi. (ser. 5); Puteshestvie v Turkestan (Zoogeographical results of the explorations of the late A. Fedchenko), 63 pp. 8 plates, gives an account of the fishes found in the rivers of Turkestan, describing and figuring some new species which will be referred to below.

Mesopotamia.

A. GÜNTHER has published an account of a collection of fishes from the Tigris, made by W. H. Colvill. Ann. N. H. (4) xiv. pp. 36-38, pls. viii. & ix.

Madagascar and the Mascarenes.

"Poissons et Pêches," by P. Bleeker & F. Pollen, forms Part 4 of "Recherches sur la Faune de Madagascar," by F. Pollen & Van Dam. Leyden: 1875 (1874), 4to.

The section devoted to descriptions of the species consists of 104 pages and 21 plates. A list is given of the fish belonging to the district of Madagascar, Mauritius, and the Seychelles, amounting to 800 species, 106 of which were collected in Madagascar, Nossibé, and Réunion.

East Indies.

BLEEKER has undertaken a revision of the *Apogonini*, and of the species of *Ambassis* and *Parambassis*, belonging to this fauna; Verh. Holl. Maatsch. (3) ii. No. 1, pp. 1-104: also of the Indopelagic species of the *Synanceoidei*, tom. cit. No. 3, 21 pages, 4 plates.

China.

A. GÜNTHER's "Third notice of fishes collected by Mr. Swinhoe in China," refers to those from Chefoo. 6 new species. Ann. N. H. (4) xiii. pp. 154-159.

Polynesia.

GÜNTHER, A. Die Fische der Südsee (ii. & iii.). J. Mus. Godeffr. v. & vii. pp. 25-96, pls. xxi.-lx.

Contains the continuation of the *Percidæ* (*Pristipomatidæ*, including *Gerres*), *Squamipinnes*, *Mullidæ*, *Sparidæ*, *Cirrhitidæ*, *Scorpenidæ*, *Nandidæ*, *Teuthididæ*, and *Berycidæ*.

Tasmania.

M. ALLPORT records the capture of a *Salmo salar*, which must have been bred in the colony. P. Z. S. 1874, p. 206.

New Zealand.

Notes by HUTTON, HAAST, and HECTOR. Tr. N. Z. Inst. vi. pp. 103-108; and HAAST, *op. cit.* vii. pp. 237 & 238.

HECTOR, *op. cit.* vii. pp. 239-250, gives a list of fishes caught by him on West Coast of Otago in 1874.

North and South America.

VAILLANT, L., & BOCOURT, F. Mission Scientifique au Mexique et dans l'Amérique Centrale. 4^e partie. Études sur les poissons. 5 sheets, 40 pages, 7 plates. Paris: 1874, 4to.

Commences the description of the *Percidæ*, the letterpress being occupied by the genus *Centropomus*. The collections from this region to be subsequently discussed consist of the genera *Apogon*, *Serranus*, *Plectropoma*, *Centropristis*, *Dioplites*, and of representatives of the *Berycidæ*, *Polynemidæ*, and *Sphyrenidæ*.

The *Plagopterinæ*, a small group of *Cyprinidæ*, inhabiting the Colorado River, are described by E. D. COPE in a paper on the Ichthyology of Utah. P. Am. Phil. Soc. xiv. pp. 122-139.

COPE has also described the *Siluridæ* collected by Professor Orton in the Upper Amazon. The new species will be referred to below. P. Ac. Philad. 1874, pp. 132-137.

Brazil.

C. F. LÜTKEN enumerates the fish found in the Rio das Velhas and Lagoa Santa and tributaries. Overs. Dan. Selsk. 1874, pp. 139-143.

There are also papers by the same writer on the *Characinidæ* of Central and South America, in Vid. Medd. pp. 220-240; and of Central Brazil, in Overs. Dan. Selsk. 1874, pp. 127-138.

PALÆICHTHYES.

BUNGE, A. Ueber die Nachweisbarkeit eines biserialen Archipterygium bei Selachiern und Dipnoërn. Jen. Z. Nat. viii. pp. 293-307, pls. viii. & ix.

HERTWIG, O. Ueber Bau und Entwicklung der Placoidschuppen und der Zähne der Selachier. Tom. cit. pp. 331-402, pls. xii. & xiii.

Polyodon gladius, Mart. On its anatomy; Christison, P. R. S. Edinb. viii. pp. 50 & 136.

On the yelk-string of the Plagiostomes, S. Schenk, SB. Ak. Wien, lxi. pt. 2, pp. 301-308, plate, and on the eggs of *Raia quadrimaculata*, id. *op. cit.* lxxviii. pt. 2, pp. 363-374, plate.

AGASSIZ has described the reproduction of Sharks and Rays, explaining the office fulfilled by the appendages of the ventral fins, and giving his views of the homology of these organs; P. Bost. Soc. xiv. p. 339.

Acipenser. Note on an intestinal calculus in a Sturgeon, by Delachanel & Mermet; C.R. lxxviii. p. 1859.

Acipenser schipa, Lovetzky, described and figured by Kessler in Fedchenko's Turkestan Journey, ii. pt. 6, p. 46, pl. vii. figs. 34 & 35.

Scaphirhynchus fedtschenkoi, K., re-described and figured; *id. l. c.* p. 48, pl. vi. figs. 28 & 29, & pl. vii. figs. 30-35.

Acipenser dabryanus, Dum., a specimen at Shanghai; A. Günther, Ann. N. H. (4) xiii. p. 159.

Carcharias lamia, Riss., has been obtained by Swinhoe at Shanghai; *id. ibid.* And *C. gangeticus*, caught at Bagdad; Günther, *op. cit.* xiv. p. 36.

Haast refers a species of shark, supposed to be the "Mako" of the Maories, to *Lamna cornubica*. The teeth are provided with basal cusps. Tr. N. Z. Inst. vii. p. 237.

The blood corpuscles of *Lamna cornubica* are larger than those of the Teleostei, approaching in size the Batrachia, but less than in *Lepidosiren*; Gulliver, Q. J. Micr. Sc. xii. p. 40.

Parascyllium nuchale, sp. n., M'Coy, Ann. N. H. (4) xiii. p. 15, Melbourne.

Narcacion polleni, Blkr., re-described and re-figured by Bleeker; Faune de Madagascar, pt. 4, p. 1, pl. i.

Raia porosa, sp. n., Günther, Ann. N. H. (4) xiii. p. 154, Chefoo.

Myliobatis noctula, Dum. On a monstrosity of this species found in the Adriatic; L. Paolucci, Atti Soc. Ital. 1874, pp. 60-63, pls. i. & ii.

TELEOSTEI.

ACANTHOPTERYGII.

PERCIDÆ.

L. VAILLANT makes observations on the scales of the lateral line in this family, the study of which convinces him of the heterogeneous composition of certain genera. C.R. lxxix. pp. 406-409.

Perca schrenki, sp. n., Kessler in Fedchenko's Turkestan Journey, ii. pt. 6, p. 50, pl. viii. fig. 35, Turkestan.

Centropomus, Lacép. L. Vaillant & F. Bocourt (Miss. sc. Méc. pt. 4) discuss in detail the characters and composition of this genus, giving a revision of the 7 species which they have examined, the 6 remaining being known to them only by the descriptions of Poey & Günther.

Complete descriptions, with the synonymy and figures, entire and of characteristic parts, are given of the following:—

C. undecimalis, Bl. (syn. *C. appendiculatus*, Poey), p. 17, pl. ii. fig.

1 (head); *C. nigrescens*, Gthr., p. 20, pl. i. bis, fig. 1 a-c; *C. mexicanus*, Boc., p. 23, pl. i. fig. 2 a-c; *C. cuvieri*, Boc., p. 26, pl. i. ter, fig. 1 a-c, and pl. ii. fig. 2; *C. scaber*, Boc., = *C. affinis*, Steind., p. 31, pl. i. fig. 1 a-c; *C. armatus*, Gill, p. 34, pl. i. ter, fig. 2; *C. unionensis*, Boc., p. 37, pl. i. fig. 3 a-c, pl. i. bis, fig. 2 a.

Aprion pristipoma, Blkr., figured, and *A. microlepis*, Blkr., re-described and figured, p. 26, pl. xvii. fig. 2; Bleeker & Pollen, Faune Madag. pt. 4.

Centropristis luciopercanus, Poey, figured; *iid. tom. cit.* pl. v. fig. 1 a, b. (*Anthias*) *Odontanthias borbonicus*, C. V., re-described and figured; *iid. tom. cit.* p. 16, pl. v. fig. 1.

(*Serranus*) *Epinephelus flavoceruleus*, Lac., var. *melanometopon*, re-described, p. 17, and *E. polleni*, Blkr., *retouti*, Blkr., and *boenack*, re-described and figured, pp. 20 & 21, pls. vii. viii. & xii. fig. 1; *iid. tom. cit.*

Serranus atricauda, sp. n., Günther, Ann. N. H. (4) xiii. p. 230, Morocco.

Figures of the following are given by Vaillant & Bocourt, Miss. Sci. Méx. pt. 4, the letterpress referring to them not having yet appeared:—

Serranus courtadii, Boc., pl. ii. figs. 3 & 3 a; *S. itaiara*, Licht., pl. ii. figs. 4 & 4 a; *S. capreolus*, Poey, pl. iii. fig. 1 a-c; *Lutjanus pacificus*, Boc., pl. iii. figs. 2 & 2 a; *S. maculato-fasciatus*, Steind., pl. iv. fig. 1; *Dioplites treculii*, sp. n., pl. iv. fig. 2 a & b; *D. (Grystes) salmoides*, Holbr., pl. iv. fig. 3 a & b (scales); *D. variabilis*, Les., pl. iv. fig. 4 a & b (scales); *D. nuecensis*, Gir., pl. iv. fig. 5 a & b (scales).

Plectropoma huntii, sp. n., Hector, Tr. N. Z. Inst. vii. p. 240, pl. x. fig. 1*, Chatham Islands.

Plectropoma chlorurum, C. V., pl. v. fig. 2 a-c, *P. chloropterum*, C. V., pl. v. figs. 3 a-c; Vaillant & Bocourt, l. c.

Grammistes ocellatus, Blkr. (Gthr.), and *G. punctatus*, C. V., re-described and figured; Bleeker & Pollen, Faune Madag. p. 4, pp. 23 & 24, pls. xiv. & xiii.

(*Genyoro*) *Lutjanus octovittatus*, Lac., *quinquelineatus*, Bl., and *bangalensis*, Bl., re-described and figured, with remarks on their specific distinctions and synonymy; *iid. l. c.* pp. 27-35, pls. xix. fig. 1, xvi. fig. 3, and ix. fig. 2.

Ambassis. Bleeker, Verh. Holl. Maatsch. (3) ii. No. 2, pp. 87-105, revises the Indo-pelagic species of this genus, separating *A. apogonoides*, Blkr., and *microlepis*, Blkr., with an outer row of much longer and more distantly placed teeth, under the generic title *Parambassis*, p. 102.

Apogon. Bleeker, *tom. cit.* No. i. pp. 1-81, considers that the appellation *Amia*, Lac. (1763), should by virtue of priority be substituted for *Apogon*; and, adopting this generic name, he epitomizes and re-characterizes all the Indo-pelagic species hitherto known, adding *A. urostigma*, sp. n., p. 51 (figured in Atl. Ichth. Perc. pl. lxix. fig. 5) from Singapore.

Apogon pharaonis, sp. n., Bellotti, Atti Soc. Ital. 1874, p. 264, Egypt, near Suez.

Chilodipterus. Bleeker proposes *Paramia* as a substitute for *Chilo-*

dipterus, which he considers ought, if retained, to be applied to the genus *Temnodon* (l. c. p. 74). He further separates, under the new name *Pseudamia*, the species *Chilodipterus polystigma*, Blkr., and *amblyuopterus*, Blkr., on the strength of their smaller cycloid scales and convex caudal, p. 79. He re-characterizes the Indo-pelagic species of *Chilodipterus*, pp. 74-81.

Lanioerca mordax, Günth., = *Esox lewini* (Griffith ?), Cuvier, An. Kingd. ed. x. p. 465, pl. lx. (1834). T. Gill, Ann. N. H. (4) xiv. p. 159.

Dules guamensis, C. V., is, according to Günther, probably only a variety of *D. argenteus*, Benn.: the latter figured. J. Mus. Godeffr. iii. 1873, pl. xix. fig. c: diagnosis, *op. cit.* v. 1874, p. 25.

Diagramma Günther, *op. cit.* v., gives diagnoses and figures of *D. punctatissimum*, Playf., p. 27, pl. xxi.; *D. pica*, C. V., p. 27, pl. xxii. fig. A; *D. orientale*, Benp., p. 28, pl. xxii. fig. B & C; *D. lessoni*, C. V., p. 28, pl. xxiii.

Scolopsis trilineatus, Kner; diagnosis and figure. Günther, *tom. cit.* p. 31, pl. xxv. fig. A.

Heterognathodon microdon, Blkr., = *H. caninus*, C. V.; diagnosis by Günther, *tom. cit.* p. 32.

Symphorus spilurus, sp. n., *id. tom. cit.* p. 61, pl. xlv. Pelew Islands.

Pentapus aurolineatus, Lac.; diagnosis and figure. *Id. tom. cit.* p. 33, pl. xxv. fig. B.

Cesio argenteus, Blkr.; diagnosis and figure. *Id. tom. cit.* p. 33, pl. xxiv. fig. B, and diagnosis of *C. cylindricus*, Gthr., = *C. multiradiatus*, Steind., = *C. tile*, C. V., p. 34.

Cesio xanthurus, Blkr., re-described and figured; Bleeker & Pollen, Faune Madag. p. 37, pl. xi.

Gerres gigas, Gthr. Diagnosis and figure; A. Günther, J. Mus. Godeffr. v. p. 80, pl. xxiv. fig. A.

Diapterus lefroyi, sp. n., G. Brown Goode, Am. J. Sci. (3) viii. p. 123, Bermudas.

SQUAMIPINNES.

Günther describes and figures a new *Tholichthys*-form from the Atlantic, which he considers to belong to the young of *Pomacanthus*. J. Mus. Godeffr. vii. p. 97. [See Ann. N. H. 1871, viii. pp. 318-320.]

Chatodon. Günther (J. Mus. Godeffr. v.) gives diagnoses and figures of the following species:—*Ch. strigangulus*, Gm. (syn. *Ch. triangularis*, Rüpp., *trifascialis*, Q. G., *bifascialis*, C. V.), p. 35, pl. xxvi. fig. A; *Ch. plebeius*, Brouss., p. 35, pl. xxxii. fig. B; *Ch. setifer*, Bl., p. 36, pl. xxvi. fig. B; *Ch. ephippium*, C. V. (syn. *Ch. gárnotii*, Less.), p. 36, pl. xxvii. figs. A & B; *Ch. semeion*, Blkr., p. 37, pl. xxviii.; *Ch. unimaculatus*, Bl., p. 37 (diagnosis only); *Ch. bennetti*, C. V. (syn. *Ch. vinctus*, Benn.), p. 37, pl. xxix. fig. A; *Ch. quadrimaculatus*, Gray, p. 38, pl. xxx. fig. A; *Ch. ornatissimus*, C. V., p. 38, pl. xxx. fig. B; *Ch. fremblii*, Benn., p. 39, pl. xxix. fig. B; *Ch. falcula*, Bl. (syn. *Ch. ulietensis*, C. V.), p. 39, pl. xxvii. fig. C; *Ch. humeralis*, Gthr. (diagnosis only), p. 40; *Ch. collaris*, Bl. (syn. *Ch. reticulatus*, C. V.), p. 40, pl. xxxi. fig. A; *Ch.*

trichrous, sp. n., p. 40, pl. xxxvi. fig. A, Society Islands; *Ch. flavirostris*, sp. n., p. 41, pl. xxxii. fig. A, Vavau; *Ch. vittatus*, Bl. (syn. *Ch. austriacus*, Rüpp.), p. 41 (diagnosis only); *Ch. lunula*, Lac., p. 42, pl. xxxiii.; *Ch. vagabundus*, L., p. 43 (diagnosis only); *C. pelewensis*, Kner (syn. *Ch. punctato-fasciatus*, var., Gthr.), p. 43, pl. xxxi. fig. B; *Ch. multicinctus*, Garrett, p. 44, pl. xxxiv. fig. B; *Ch. rafflesi*, Benn. (syn. *Ch. princeps*, C. V.), p. 44, pl. xxxv. fig. C; *Ch. melanotus* (syn. *Ch. dorsalis*, C. V.), p. 44 (diagnosis only); *Ch. mertensi*, C. V., p. 45, pl. xxxvi. fig. B; *Ch. lineolatus*, C. V. (syn. *Ch. lunatus*, C. V.), p. 45, pl. xxxiv. fig. A; *Ch. miliaris*, Q. G., p. 46, pl. xxxv. fig. A; *Ch. tau-nigrum*, C. V., p. 47 (diagnosis only); *Ch. citrinellus*, Brouss., p. 47, pl. xxxv. fig. B; *Ch. strigatus*, C. V., p. 47 (diagnosis only).

V *Parachætodon*, g. n., for *Chætodon oligacanthus*, Blkr.; Bleeker, Versl. Ak. Amst. viii. p. 371.

Chelmo trochilus, sp. n., Günther, Ann. N. H. (4) xiv. p. 368, Australia.

Heniochus, C. V. Diagnoses and figures of *H. macrolepidotus*, L., p. 48, pl. xxxvii.; *H. monoceros*, C. V., p. 49, pl. xxxviii.; *H. chrysostomus*, Sol. (syn. *H. melanistion*, Blkr.), p. 49, pl. xxxix. fig. A. Günther, J. Mus. Godeffr. v.

Holacanthus, Lac. Diagnoses and figures of *H. arcuatus*, Gray, p. 50, pl. xxxii. fig. C; *H. diacanthus*, Bodd., p. 50, pl. iv. fig. B; *H. bispinosus*, Gthr. (syn. *H. diacanthus*, Blkr.), p. 51, pl. lvi. fig. C; *H. bicolor*, Bl., p. 51, pl. xxxix. fig. B; *H. cyanotis*, Gthr. (syn. *H. monophthalmus*, Kn., and probably *H. luteolus*, C. V., and *H. ocularis*, Pet.), p. 52, pl. xl. fig. A; *H. flavissimus*, C. V., p. 52 (diagnosis only); *H. loriculus*, sp. n., p. 53, pl. xl. fig. C, from the stomach of a *Serranus*, Society Islands; *H. imperator*, Bl., p. 53, pl. xli. fig. A; *H. nicobariensis*, Bl. (syn. *H. geometricus*, Lac.), p. 54, pl. xli. fig. B: *id. tom. cit.*

Scorpiis fairchildi, sp. n., Hector, Tr. N. Z. Inst. vii. p. 241, from Bay of Plenty; separated from *S. hectori*, Hutt.

NANDIDÆ.

P. BLEEKER, Arch. Néerl. ix., "Sur les espèces insulindiennes," re-describes and figures *Nandus nebulosus*, Gr. Hardw., p. 458, pl. viii. fig. 1; *Catopra fasciata* (*C. siamensis*, Gthr.), Blkr., p. 461, pl. viii. fig. 2; and *C. grootii*, Blkr., p. 464, fig. 3.

Plesiops bleekeri, Gthr., and *corallicola*, Blkr., described and figured; Günther, J. Mus. Godeffr. v. p. 87, pl. lviii. figs. A & B.

MULLIDÆ.

Upeneoides vittatus, Forsk. (syn. *U. bivittatus*, C. V. & Gthr.); diagnosis given by Günther, *tom. cit.* p. 56.

Mulloidés flavolineatus, Lac. (syn. *M. auriflamma*, Klunz.), diagnosis; and diagnoses and figures of *M. ruber*, Kl.: *id. ibid.* pl. xxiii. fig. A.

Mulloidés samoensis, sp. n., *id. tom. cit.* p. 57, pl. xliii. fig. B, Apia.

Upeneus, Blkr. Günther, *tom. cit.*, has revised the synonymy and given figures and diagnoses of *U. barberinus*, Lac., p. 57, pl. xlii.; *U. indicus*,

Sh., p. 57; *U. pleurostigma*, Benn. (syn. *U. brandesi*, Blkr.), p. 58; *U. malabaricus*, C. V. (syn. *U. griseofrenatus*, Kn.), p. 58, pl. xlv. fig. B; *U. bifasciatus*, Lac., p. 59, pl. lxiv. fig. A; *U. trifasciatus*, Lac. (syn. *Mullus multifasciatus*, Q. G.), p. 59, pl. lxiv. figs. B & C; *U. chryserythrus*, Lac. (syn. *U. cyclostomus*, C. V., part, nec Lacép., *U. oxycephalus*, Blkr.), p. 60, pl. xlv. fig. A, the latter species separated from *U. chryserythrus*, C. V., = *M. cyclostomus*, Lac.

Parupeneus bifasciatus, Lac., and *multifasciatus*, Q. & G., re-described and figured; Bleeker & Pollen, Faune Madag., pp. 40 & 42, pls. xviii. fig. 2, and xix. fig. 3.

SPARIDÆ.

Haplodactylus meandratius, Banks & Sol., re-described and figured by Hector, Tr. N. Z. Inst. vii. p. 241, pl. x. fig. 6 B; *H. fergussoni*, sp. n., Kawakawa Bay, East Cape, *id.* l. c. p. 243.

Girella percoides, sp. n., *id.* l. c. p. 243, pl. x. fig. 6 D, New Zealand.

Crenidens macracanthus, sp. n., Günther, Ann. N. H. (4) xiv. p. 368, Madras.

Lethrinus, Cuv. Günther, J. Mus. Godeffr. v., remarks upon the great difficulty there is in recognizing the species of this genus as defined by Cuvier, and enumerates as authentically Polynesian species, giving diagnoses, synonymy, and figures:—*L. miniatus*, Bl. (syn. *L. rostratus*, C. V., and *L. ramak*, Kl., nec Rüpp.), p. 63; *L. amboinensis*, Blkr., p. 63; *L. moensii*, Blkr. (syn. *L. genivittatus*, Playf.), p. 64, pl. lxvi. fig. A; *L. ramak*, Forsk. (syn. *L. flavescens*, C. V., and *ehrenbergi*, C. V., *L. ramak*, Rüpp.), p. 64, pl. xlv. fig. B; *L. bonhamensis*, sp. n., p. 65, pl. xlvii. Bonham Island; *L. mahsena*, Forsk. (*L. bungus*, C. V., and *abbreviatus*, C. V.), p. 65, pl. xlviii.

Pentapodus nubilus, Cant., ? = *Lethrinus nebulosus*; *id.* tom. cit. p. 62.

Chrysophrys swinhonis, sp. n., *id.* Ann. N. H. (4) xiii. p. 155, Chefoo.

Pimelepterus fuscus, Lac., from Polynesia, and *P. waigiensis*, Q. G. (syn. *P. marciac*, C. V.), diagnoses; *id.* J. Mus. Godeffr. v. p. 68.

CIRRHITIDÆ.

Cirrhitès, Cuv. Diagnoses and figures of *C. fosteri*, p. 69, pl. xlix. fig. A; *C. hemistictus*, sp. n., p. 69, p. l. fig. B, and *C. polystictus*, sp. n., p. 70, pl. l. fig. A, Society Islands; *C. arcatus*, C. V., p. 70, pl. xlix. figs. B & C; *C. oxycephalus*, Blkr., p. 71; *C. maculatus*, Lac. (syn. *C. alternans*, Gill), p. 71, pl. li. fig. A; *C. melanotus*, sp. n., p. 72, pl. lii. fig. C, Raiatea; *C. cinctus*, Gthr. (syn. *C. fasciatus*, Benn., nec Cuv.), p. 72, pl. lii. figs. A & B: Günther, tom. cit.

Cirrhitès punctatus, C. V., re-described and figured; Bleeker & Pollen, Faune Madag. p. 38, pl. xv. fig. 2.

Chilodactylus vittatus, Garrett. Diagnosis and figure; Günther, tom. cit. p. 73, pl. xli. fig. B.

Chilodactylus douglasi, sp. n., Hector, l. c. p. 244, pl. x. fig. 11 B, Ngunguru Bay and Bay of Islands.

SCORPÆNIDÆ.

Scorpena, Art. The composition of this genus revised, all the species of *Sebastes* which have 24 vertebrae being now included in it, and the latter name being restricted to those which have more than 24. Günther, *tom. cit.* p. 74. Diagnoses and figures of *S. guamensis*, Q. G. (syn. *S. rubropunctata*, C. V. & Kl., *Sebastes minutus*, C. V., *S. chilioprista*, Rüpp., *S. polylepis*, Blkr.), p. 74, pl. lvi. fig. B; and *S. parvipinnis*, Garrett, p. 75, pl. lii. fig. D; *S. tristis*, Kl., p. 77, diagnosis only; *S. cirrhosa*, Thunb. (syn. *S. polyprion*, Playf.), p. 78, pl. liv.; *S. gibbosa* (syn. *S. diabolus*, C. V.), p. 79, pl. liii.; *S. dentata*, sp. n., Pelew Islands, *S. nuchalis*, sp. n., Raratonga, p. 76; *S. albobrunnea*, sp. n., Pelew Islands, p. 77; *S. cookii*, sp. n., Raoul Islands, p. 78, pl. lv.

Scorpena barathri, sp. n., Hector, *l. c.* p. 245, pl. x. fig. 15 A, obtained by the Challenger Expedition off Cape Farewell.

Pterois radiata, C. V., p. 81, pl. lvi. fig. A, is more plentiful in the South Pacific than in the Indian Ocean, while *Pt. volitans*, p. 81, and *Pt. zebra*, p. 82, are rare in the former; *Pt. brachyptera* is known from Samoa, p. 82; Günther, *tom. cit.*

Tenianotus triacanthus, Lac., and *garretti*, sp. n., Sandwich Islands, described and figured; Günther, *tom. cit.* p. 83, pl. lvii. figs. A, B & C.

Synancia verrucosa, Bl., described, and its poisonous dorsal spine figured; *id. tom. cit.* pp. 84 & 85.

Synancia platyrhynchus, sp. n., Bleeker, Verh. Holl. Maatsch. (3) ii. No. 3, p. 118, pl. i. fig. 2, Moluccas; *S. horrida*, Bl. & Schn., and *verrucosa*, Bl. & Schn., re-characterized and figured, *id. tom. cit.* pp. 116 & 119, pl. i. fig. 2, pl. ii. fig. 2.

✓ *Leptosynanceia*[-cia], g. n., with a different physiognomy from *Synancia*; upper surface of head nearly smooth, eyes directed upwards, skin almost smooth, dorsal with 16 spines, pectorals simple-rayed, ventrals 4-rayed. For *S. aëroblepa*, Rich. *Id. tom. cit.* p. 121, pl. iv. fig. 2.

Pelor brachyrhynchus, sp. n., *id. tom. cit.* p. 109, pl. iii. fig. 2, pl. ii. fig. 4, Singapore; *P. didactylus*, Pall., re-characterized and figured, p. 111, pl. iv. figs. 1 & 1a; *P. cuvieri*, Gr. Hardw., re-characterized, p. 112.

TEUTHIDÆ.

Teuthis striolata, Gthr., and *rostrata*, C. V., figured by Günther, J. Mus. Godeffr. v. pl. lix. fig. A, pl. 1; diagnoses of *T. concatenata*, C. V., *corallina*, C. V., *albopunctata*, Schleg., p. 88, *T. hexagonata*, Blkr., *argentea*, G. G., *marmorata*, Q. G., *doleata*, Cuv., pp. 89 & 90, *T. puella*, Schleg., *vulpina*, Schleg. & Müll., p. 91; also a note on the difficulty of recognizing *Amphacanthus guttatus* (? *punctatus*), Forster & Bl., previously referred to *T. nebulosa*, p. 91.

BERYCIDÆ.

Trachichthys intermedius, sp. n., Hector, *l. c.* vii. p. 246, pl. xi. fig. 18 A, obtained by the Challenger Expedition off Cape Farewell.

Myripristis murdjan, Forsk. (syn. *M. adustus*, Blkr.), varr. α , *murdjan*, β , *intermedia*, γ , *adusta*, described and figured; Günther, *tom. cit.* p. 92, pls. lxi. & lxii.

Myripristis multiradiatus, sp. n., *id. tom. cit.* p. 93, Vavau.

✓ *Holotrachys*, subg. n. of *Myripristis*, for *M. lima*, C. V.; *id. tom. cit.* p. 93, pl. lxiii. fig. A.

Myripristis borbonicus, C. V. ?, described and figured; Bleeker & Pollen Faune Madag. pt. 4, p. 15, pl. vi.

Holocentrum unipunctatum, sp. n., Günther, *tom. cit.* p. 95, pl. lxv. fig. A, Tonga Islands; diagnoses of *H. spiniferum*, Forsk. (*H. leo*, C. V.), p. 94, *H. caudimaculatum*, Rüpp. (*H. spiniferum*, C. V.), p. 95, *H. rubrum*, Forsk., p. 96.

SCIENIDÆ.

Corvina nigripinnis, sp. n., Günther, Ann. N. H. (4) xiv. p. 453, Cameroon country.

Otolithus aureus, Rich., re-described from Chefoo; *id. op. cit.* xiii. p. 155.

Umbrina lafonti, sp. n., Moreau, R. Z. (3), ii. p. 118, pl. xiv. Gulf of Gascony.

XIPHIIDÆ.

Xiphias gladius, L. A statement of the occurrence of this species in the Southern Hemisphere; Hector, Tr. N. Z. Inst. vii. p. 246.

ACRONURIDÆ.

Rhomboides polyzona, Blkr., re-described and figured; Bleeker & Pollen, Faune Madag. p. 44, pl. xii. fig. 2.

CARANGIDÆ.

Equula elongata, sp. n., Günther, Ann. N. H. (4) xiv. p. 369, N. Celebes.

Caranx koharu, sp. n., Hector, l. c. vii. p. 247, pl. xi. fig. 24 A, Tutukaka Harbour, New Zealand.

NOMEIDÆ.

Gasterochisma melampus, Rich., re-described and figured; Hutton, Tr. N. Z. Inst. vi. p. 104, pl. xviii. fig. 30.

SCOMBRIDÆ.

Platystethus abbreviatus, sp. n., Hector, l. c., vii. p. 247, pl. xi. fig. 31 A, obtained by the Challenger Expedition off Cape Farewell.

TRACHINIDÆ.

✓ *Cheimarrichthys* [*Chi-*], g. n. Body stout, head spatuliform, broad and

depressed, scaleless, opening of mouth slightly oblique, and with upper jaw longer; eyes lateral, somewhat directed upwards, scales small, ctenoid; villiform teeth in both jaws and on vomer; two separate dorsals, the first with 3 small but sharp spines, of which the third is largest; each with a small posterior membrane to prevent the spine from rising to the vertical; ventrals jugular, pectoral rays branched, opening of gills large; operculum and præoperculum entire, 6 branchiostegals, lateral line continuous. *C. fosteri*, sp. n., Haast, Tr. N. Z. Inst. vi. p. 103, pl. xviii. fig. 38, Otira River.

Kathetostoma monopterygium, Gthr. Having found that two species have been confounded under this name, Hutton separates them as, 1, *K. (Uranoscopus) maculosa*, Sol. (*U. maculatus*, Rich. & Forster); 2, *K. (Anema) monopterygium*, Gthr. (*U. maculatus*, J. R. Forster, *apud* Schn.); Tr. N. Z. Inst. vi. pp. 104 & 105.

Leptoscopus (?) *angusticeps*, sp. n., Hutton, *tom. cit.* p. 106, pl. xix. fig. 36, Greymouth Lagoon; and *L. macropygus*, Rich., re-described [*cf.* Ann. N. H. xii. 1872, p. 401].

Leptoscopus robsoni, sp. n., Hector, *l. c.* vii. p. 248, Cape Campbell.

Opisthognathus. Bleeker, Arch. Néerl. ix., "Sur les espèces insulindiennes des Opisthognathoides," re-describes and figures, *O. castelnaui*, Blkr., p. 469, fig. 4; *O. solorensis*, Blkr. p. 471, fig. 3; *Gnathypops papuensis*, Blkr., p. 473, fig. 2; and *G. rosenbergi*, Blkr., p. 474, fig. 1.

Notothenia veitchi, sp. n., Günther, Ann. N. H. (4) xiv. p. 370, Chonos Archipelago.

COTTIDÆ.

✓ *Rhamphocottus*, g. n. (Cottid). Head exceedingly large, compressed, snout produced into a short narrow beak, the feeble lower jaw received within the upper; eyes lateral; body small, compressed, covered with prickles; 2 dorsal fins of moderate height, pectorals with nearly all the rays simple; ventrals thoracic, 3-rayed; jaws and vomer with villiform teeth; no teeth on the palate. *R. richardsoni*, sp. n., Günther, *tom. cit.* p. 369, Fort Rupert, N. America.

Cottus spinulosus, Kessler, figured by Kessler in Fedchenko's Turkestan Journey, ii. pt. 6, p. 4, pl. i. figs. 1 & 2.

Cottus hexacornis, Rich. (? *C. scorpius*, Fabr.), obtained at Broer-Ruys, and *C. porosus*, C. V., from Clavering's Straits, noticed by Peters, Zweite Deutsche Nordpolarfahrt, pp. 169 & 170.

Uranidea wheeleri, sp. n., Cope, Tr. Am. Phil. Soc. xiv. p. 138, Beaver River.

Polycaulus elongatus, C. V., re-characterized and figured; Bleeker, Verh. Holl. Maatsch. (3) ii. No. 3, p. 124, pl. ii. fig. 2.

Platycephalus cultellatus, Rich., re-described from Chefoo; Günther, Ann. N. H. (4) xiii. p. 156.

✓ *Parabembras*, g. n., for *Bembras curtus*, Schl.; Bleeker, Versl. Ak. Amst. (2) viii. p. 370.

DISCOBOLI.

Liparis gelatinosus, Pall., noticed and figured by Peters, *l. c.* p. 171, pl. i. fig. 2.

GOBIIDÆ.

Bleeker sketches a plan for a new arrangement of this family, from which he excludes *Callionymus* and *Platyptera*. Arch. Néerl. ix. pp. 289-331. The following is an extract of the method which he proposes:—

Sub-fam. 1. ELEOTRIFORMES.

Phalanx 1. ELEOTRINI. Body sub-elongate, or elongate cylindrical anteriorly; head depressed, broader than high, or its breadth and height equal; intermaxillary teeth in several series; dorsal and anal not elongate, with 7 to 15 rays; caudal obtuse.

Sub-phalanx *a.* PHILYPNI. Vomerine teeth; teeth in jaws in several series, no canines. (Genera: *Philypnodon*, Blkr., *Bostrichthys*, Dum., *Philypnus*, Val.)

Sub-phalanx *b.* ELEOTRII. Palate toothless; head without osseous crests. (Genera: *Odonteleotris*, Gill, *Eleotris*, Gron., *Guvina*, Blkr., *Oxyeleotris*, Blkr., *Ophiocara*, Gill, *Mogurnda*, Gill, *Culius*, Blkr., *Gobiomorphus*, Gill, *Belobranchus*, Blkr., *Gymneleotris*, Blkr.)

Sub-phalanx *c.* BUTII. Head with osseous crests which are smooth or serrated, palate toothless, teeth in several series in both jaws; gill-openings extending to beneath the eye, separated by a narrow isthmus; scales on trunk ctenoid. (Genera: *Butis*, Blkr., *Gymnobotis*, Blkr., *Prionobotis*, Blkr., *Odontobotis*, Blkr.)

Phalanx 2. HYPSELEOTRINI. Body oblong, short, compressed; head compressed, higher than broad, scaly, without osseous crests, palate toothless; teeth in jaws small, in several series, no canines; scales on trunk large; dorsal and anal not elongate, caudal obtuse. (Genera: *Dormitator*, Gill, *Asteropteryx*, Rüpp.)

Phalanx 3. PARELEOTRINI. Body sub-elongate or elongate-compressed; head convex compressed, higher than broad, with osseous crests naked or without spines; teeth fixed in jaws, immovable, no vomerine, pharyngeal subulate acicular. (Genera: *Brachyeleotris*, Blkr., *Heteroeleotris*, Blkr., *Valenciennesia*, Blkr., *Eleotriodes*, Blkr., *Ptereleotris*, Gill, *Orthostomus*, Kn., *Ozymetopon*, Blkr.)

Sub-fam. 2. GOBIIFORMES.

Phalanx 1. GOBIODONTINI. Body oblong-ovate, compressed; head very obtuse, scaleless; cleft of mouth short curved, teeth in jaw in several series, simple, fixed; gill-openings not reaching below base of pectorals; dorsals contiguous or continuous at their base, the posterior dorsal and the anal short, ventral

entire, adhering at its base only to the ventral surface, caudal obtuse. D. 6-9 to 11. A. 9 or 10. (Genera: *Gobiodon*, K. V. H., *Pseudogobiodon*, Blkr., *Paragobiodon*, Blkr.)

Phalanx 2. GYMNGOBIINI. Body elongate, scaleless, head depressed, teeth fixed; ventral entire, adhering with its base only to the belly, caudal obtuse. (Genera: *Benthophilus*, Eichw., *Gymnogobius*, Gill, *Gobiosoma*, Gill, *Ophiogobius*, Gill, *Alepidogobius*, Blkr., *Boreogobius*, Gill, *Cristallogobius*, Gill.)

Phalanx 3. LATRUNCULINI. Body more or less elongate, scales moderate or large, gill-openings moderate, separated by a broad isthmus; teeth in a single series in lower jaw; dorsals widely separate, the rayed dorsal elongate, ventral entire, its base only adherent, caudal obtuse. (Genera: *Gobiophterus*, Blkr., *Leptogobius*, Blkr., *Sicyopus*, Gill, *Evorthodus*, Gill, *Latrunculus*, Günth.)

Phalanx 4. TRIENOPHORICHTHYINI. Body sub-elongate, with ctenoid scales, head prismatic conical, teeth partly tricuspid; isthmus broad; dorsals wide apart, the second and the anal short; ventral entire, adherent only at its base; caudal obtuse. (Genera: *Trienophrichthys*, Gill, *Trienopogon*, Blkr.)

Phalanx 5. SICYDIINI. Body sub-elongate or elongate-cylindrical anteriorly, head obtuse convex, teeth implanted in the gums or on the lips, moveable; isthmus broad; ventral entire, adherent to belly, with a broad central orbicular disk from which short branched rays radiate; caudal obtuse; scales ctenoid or absent. (Genera: *Tridentiger*, Gill, *Sicydium*, Val., *Sicyopterus*, Gill, *Microsicydium*, Blkr., *Lentipes*, Gthr.)

Phalanx 6. GOBIINI. Body oblong, more or less elongate; head scaleless before and between the eyes; teeth simple, their apex neither clavate nor incised, in one or many series on the intermaxillary, bi- or multiserial in the lower jaw; spinous dorsal shorter than the soft; ventral entire, adherent at its base only; gill-openings moderate or large.

Sub-phalanx a. BRACHYGOBII. Body short oblong, its height four times its length, scales large, no canines; soft dorsal and anal short, caudal obtuse convex, dorsal spines 6. (Genera: *Lophogobius*, Gill, *Brachygobius*, Blkr.)

Sub-phalanx b. PLATYGOBII. Body elongate, its height 6 times in its length, cylindrical anteriorly; head much depressed, broader than high, acute; teeth multiserial in both jaws; gape wide; soft dorsal and anal short, caudal obtuse, dorsal spines 6. (Genera: *Gillichthys*, Coop., *Gobiopsis*, Steind., *Glossogobius*, Gill, *Platygobius*, Blkr.)

Sub-phalanx c. EUGOBII. Body elongate, its height 5 to about 9 times in its length; head more or less obtuse, higher than broad or slightly broader than long, lower jaw without cirri; gape moderate or small; caudal entire, obtuse, or acute; teeth in the jaws fixed. (Genera: *Gobius*, Art., *Stenogobius*, Blkr., *Callogobius*, Blkr., *Hypogymnogobius*, Blkr., *Hemigobius*, Blkr.,

Encyclogobius, Gill, *Lepidogobius*, Gill, *Actinogobius*, Blkr., *Acanthogobius*, Gill, *Cephalogobius*, Blkr., *Awaous*, Val., *Rhinogobius*, Gill, *Ctenogobius*, Gill, *Centrogobius*, Blkr., *Acentrogobius*, Blkr., *Porogobius*, Blkr., *Amblygobius*, Blkr., *Cryptocentrus*, Ehr., *Pterogobius*, Gill, *Chaenogobius*, Gill, *Zonogobius*, Blkr., *Odontogobius*, Blkr., *Stigmatogobius*, Blkr., *Euctenogobius*, Gill, *Oxyurichthys*, Blkr.)

Sub-phalanx d. CHÆTURICHTHYI. Body elongate, its height 8 to 9 times in its length, cylindrical anteriorly; head convex, not depressed or compressed, scaly above and on the sides; no canines; lower jaw with several cirri; caudal obtusely or acutely lanceolate, longer than the head. (Genera: *Chæturichthys*, Rich., *Amblychæturichthys*, Blkr., *Parachæturichthys*, Blkr.)

Sub-phalanx e. GOBIONELLI. Body much elongate, its height 10 to 14 times in its length; head not depressed, obtuse, convex, scaly, the cheeks naked, lower jaw without cirri; soft dorsal elongate, thrice the length of the spinous; caudal lanceolate; isthmus broad; no canines. (Genera: *Synechogobius*, Gill, *Gobionellus*, Gir.)

Phalanx 7. PERIOPHTHALMINI. Body elongate, cylindrical anteriorly; head very convex, truncated, compressed, densely scaly above and on sides; eyes erectile, protected above by a broad scaly movable skin and beneath by a broad free lower eyelid; suborbital-rostral skin pendulous; teeth conical, fixed, in one or two series in the jaws; pharyngeal teeth partly acicular and partly conical; scales cycloid; dorsals sub-equal, the anterior flabelliform; pectoral with a long brachium or base largely squamose, caudal obliquely rounded; ventral entire or deeply divided. B. 5. (Genera: *Periophthalmus*, Bl., Schn., *Euichthys*, Gill, *Periophthalmodon*, Blkr.)

Phalanx 8. APOCRYPTEINI. Body elongate; head slightly compressed, obtuse, convex, above anteriorly and on sides densely squamose, teeth uniserial, in lower jaw sub-horizontal. Canine teeth, 2 in lower jaw, postsymphysial. Scales of body small cycloid. Rayed dorsal elongate, more than double or triple the length of the spinous. Ventral entire, sub-tubular, adherent at its base only. Isthmus broad. B. 5.

Sub-phalanx a. APOCRYPTEI. Caudal lanceolate; eyes scarcely or not erectile, without free eyelid; spinous dorsal not higher than long. (Genera: *Apocryptodon*, Blkr., *Parapocryptes*, Blkr., *Apocryptes*, Val., *Pseudapocryptes*, Blkr.)

Sub-phalanx b. BOLEOPHTHALMI. Caudal lanceolate or obliquely rounded; eyes erectile with movable supra-orbital skin, and broad free infra-orbital or palpebral skin; dorsals widely apart, anterior higher than long. (Genera: *Boleophthalmus*, Val., *Scartelaos*, Swns.)

Sub-fam. 3. AMBLYOPODIFORMES.

Phalanx 1. AMBLYOPODINI. Body very elongate, no post-temporal

fossa; ventral entire, base only adherent. B. 5. (Genera: *Tyntilastes*, Gthr., *Brachyamblyopus*, Blkr., *Gobioides*, Lac., *Odontamblyopus*, Blkr., *Tænioides*, Lac.)

Phalanx 2. TRYPAUCHENINI. Body and head much compressed, a deep post-temporal fossa; scales small, deciduous; ventral entire or deeply cleft, adherent only at base. B. 4. (Genera: *Trypauchen*, Val., *Trypauchenichthys*, Blkr.)

Sub-fam. 4. LUCIOGOBIIFORMES. Body scaleless, elongate. Dorsal single, short, nearer to caudal than to head, with no distinct spinous portion; ventrals wholly united. (Genus: *Luciogobius*, Gill).

Gobius. 5 Danish species described, with observations on the structure of the scales. The male of *G. microps*, Krøyer, fully described. G. Winther, Nat. Tids. (3) ix. pp. 191-226. *G. orca* and *scorpioides*, Collett, Förh. Selsk. Chr. 1874, pp. 172 & 175, pl. iii. figs. 1-3 & 4-6, & Ann. N. H. (4) xiii. pp. 446 & 447, Norway.

Gobius caffer, Port Elizabeth, *natalensis*, Port Natal, Günther, Ann. N. H. (4) xiv. p. 453: spp. nn.

Gobius semilunaris, Heck., and *rubromaculatus*, Kriesch., = *marmoratus*, Pall.; the latter described. C. Koelbel, Verh. z.-b. Wien, xxiv. pp. 569-574.

Gobius. The following species are re-described and figured:—*G. macrorhynchus*, Blkr., p. 48, pl. xx. fig. 1; *madagascariensis*, Blkr., p. 49, pl. xxi. fig. 2; *hypselosoma*, Blkr., p. 51, pl. xxi. fig. 1; *melanopterus*, Blkr., p. 52, pl. xx. fig. 1; *isognathus*, Blkr., p. 53, pl. xv. fig. 1; *polyzona*, Blkr., p. 55, pl. xvii. fig. 1; *auchenotenaria*, Blkr., p. 56, pl. xviii. fig. 1; *samberanoensis*, Blkr., p. 57, pl. xix. fig. 2; *vergeri*, Blkr., p. 58, pl. xix. fig. 1: Bleeker & Pollen, Faune Madag. pt. 4.

Latrunculus. The northern species monographed; R. Collett, Förh. Selsk. Chr. 1873, pp. 1-12.

Sicydium fasciatum, sp. n., Day, J. A. S. B. (n. s.) xliii. pt. 2, p. 31, Burmah.

Trienophorichthys tæniatus, sp. n., and coloration of *T. trigonocephalus*, Gill, from Chefoo, described; Günther, Ann. N. H. (4) xiii. p. 156.

Eleotris madagascariensis, Val. ?, re-described; Bleeker & Pollen, Faune Madag. p. 46.

Eleotriodes, Blkr., is not distinct from *Valenciennesia*, Blkr. (re-characterized, p. 372); *Amblyeleotris*, g. n., for *Eleotris periophthalmus*, Blkr., p. 373, and *Brachyteleotris*, g. n., for *E. cyanostigma*, Blkr., and *B. ensifera*, sp. n., Buru Island, Kajeli, pp. 374-376. Bleeker, Versl. Ak. Amst. (2) viii.

✓ *Doliichthys*, g. n. General appearance of *Agonus*. Body covered with large spinous tubercles. Head broad and flat. Teeth in several rows in jaws, none on palate. Mouth cleft obliquely, lower jaw a little the longer. Eyes above. Dorsals separate, the anterior with few rays. Anal developed like soft dorsal, terminating some distance from caudal. Ventrals spineless, united into a disk not adherent to belly, with six greatly divided rays.

Anal papilla prominent. Branchial openings vertical, rather wide. Branchiostegals 4. Isthmus very wide. Pseudobranchiæ present. *D. stellatus*, sp. n. (d. $4\frac{1}{2}$, a. $\frac{1}{2}$), Sauvage, R. Z. (3) ii. p. 336, River Don.

CEPOLIDÆ.

- ✓ *Acanthocephala*, g. n., for *Cepola krusensterni*, Schl.; Bleeker, Versl. Ak. Amst. (2) viii. p. 369.

HETEROLEPIDINA.

- ✓ *Octogrammus*, g. n., for *Labrax octogrammus*, Schl. (re-named *pallasi*); id. *tom. cit.* p. 370.

BLENNIIDÆ.

- ✓ *Lepidoblennius*, g. n. Body oblong, covered with very small cycloid scales. No lateral line. Muzzle short, cleft of mouth oblique, lower jaw a little the longer. No molars or palatine teeth; one row of strong non-movable teeth; one pair of hooked teeth rather larger than the others, placed in advance at the mandibular symphysis. Branchial opening very narrow, vertical; isthmus wide; pseudobranchiæ present; 3 branchiostegal rays. A few pores on cheek. Ventrals jugular, not united, composed of 5 soft rays. Two dorsals with flexible rays, not branched, occupying the whole length of the back, contiguous at the base. Anal developed like second dorsal. Caudal free, cut square. No anal papilla. *L. caledonicus*, sp. n. (d. $\frac{7}{8}$, a. $\frac{1}{2}$), Sauvage, R. Z. (3) ii. pp. 337 & 338, New Caledonia.

- ✓ *Gunnellops*, g. n., for *Gunnellus roseus*, Val.; Bleeker, *tom. cit.* p. 368. *Alticus monochrous*, Blkr., and *aspilus*, Bleeker, re-described and figured; Bleeker & Pollen, *l. c.* pp. 60 & 63, pl. xvi. figs. 1 & 2.

Nemophis, Kp. (*Xiphogadus*, Gthr.), ought to be *Xiphasia*, Sw. Remarks on the history and nomenclature of the *Nemophidæ*, with description and figure of *X. setifer*. Putnam, P. Bost. Soc. xvi. pp. 366-373.

MASTACEMBELIDÆ.

- ✓ *Pararhynchobdella*, g. n., for *Rhynchobdella maculata*, Rwdt.; Bleeker, Vers. Ak. Amst. (2) viii. p. 368.

SPHYRÆNIDÆ.

Sphyræna pinguis, sp. n., Günther, Ann. N. H. (4) xiii. p. 157, Chefoo.

MUGILIDÆ.

Mugil cephalotus, C. V., re-described, and figured, and distinguished from *M. japonicus*, Schl.; Bleeker & Pollen, Faune Madag. pt. 4, p. 45, pl. ii. fig. 1.

Agonostoma globiceps, sp. n., Günther, *op. cit.* xiv. p. 370, Vera Cruz.

GASTEROSTEIDÆ.

SAUVAGE, H. E. Révision des espèces du groupe des Épinoches. N. Arch. Mus. x. pp. 5-32, pl. i.

- ✓ The author divides *Gasterosteus* into 3 subgenera, viz., *Gasterosteus*, *Gasterosteia*, and *Gastræa*, giving diagnoses of all the species under these heads, and figuring *Gasterosteus ponticus*, Nordm., fig. 1, *G. noveboracensis*, C. V., fig. 3, *G. loricatus*, Reinh., fig. 2, *G. niger*, C. V., fig. 14, *G. serratus*, Gir., fig. 11, *G. plebeius*, Gir., fig. 10, *G. inopinatus*, Gir., fig. 4, *G. biaculeatus*, Mitch., fig. 12, *G. microcephalus*, Gir., fig. 15, *G. agyropomus*, C. V., fig. 6, *G. tetracanthus*, C. V., fig. 7, *G. apelles*, C. V., fig. 13; *Gasterosteia occidentalis*, C. V., fig. 18. *Gasterosteus noveboracensis*, De Kay, nec C. V., is re-named *suppositus*, p. 11.

Gasterosteus blanchardi, p. 32, fig. 16, *islandicus*, p. 20, fig. 8, Iceland, *texanus*, p. 15, fig. 5, Texas, and *algeriensis* (indicated by Ger-vais), Algeria, p. 17; *id. l. c. pl. i. : spp. nn.*

LABYRINTHICI.

P. CARBONNIER shows that the pharyngeal cells are not used as reservoirs for water in certain members of the "Pharyngiens labyrinthiformes" of Cuvier; C. R. lxxviii. pp. 501 & 502. Note on the same by E. Blanchard, *tom. cit.* p. 502.

TRACHYPTERIDÆ.

Trachipterus weychardti, sp. n., Philippi, Arch. f. Nat. xl. pp. 118-121, pl. iii. from the Chilian seas (described from a photograph, the specimen having been lost).

NOTACANTHI.

- ✓ *Polyacanthonotus*, g. n., for *Notacanthus risoanus*, Fil. Veran.; Bleeker, Versl. Ak. Amst. (2) viii. p. 368.

ACANTHOPTERYGII PHARYNGOGNATHI.

POMACENTRIDÆ.

Glyphidodon rhyncholepis, Blkr., re-described and figured; Bleeker & Pollen, Faune Madag. pt. 4, p. 8, pl. iv. fig. 2.

LABRIDÆ.

Chærops dodecacanthus, Blkr., re-described and figured; *id. tom. cit.* p. 4, pl. iii.

Chilinus rostratus, from Cebu; Cartier, Ver. Ges. Würzb. v. p. 103.

Xiphochilus robustus, Gthr., *gymnogenys*, Gthr., and *fasciatus*, Gthr., are referred to true *Chærops*; Bleeker & Pollen, *tom. cit.* p. 6.

Hemicoris caudimacula, Q. & G., re-described; it possesses the tooth

at angle of upper jaw, the existence of which has been denied: *iid.*
ibid.

Labrus mixtus. On its habits; Spence Bate, Q. J. Micr. Sc. xii. p. 402.

CHROMIDÆ.

Paretroplus damii, Blkr., re-described and figured; Bleeker & Pollen, Faune Madag. pt. 4, p. 13, pl. iv. fig. 3.

Paratilapia polleni, Blkr., re-described and figured; *iid. tom. cit.* p. 11, pl. v. fig. 2.

Tilapia oligacanthus, Blkr., re-described and figured; *iid. tom. cit.* p. 11, pl. iv. fig. 1.

Haligenes tristrami, Gthr. (= *Coptodon zillii*, Gerv., = *Perca guyoni*, Heck.). Note on this species with reference to the fauna of the Algerian Sahara; P. Gerraiss, J. Zool. iii. p. 455.

ANACANTHINI.

GADOIDEI.

Gadus glacialis, sp. n., Peters, Zweite Deutsche Nordp.-fahrt, p. 172, Sabine Island.

✓ *Lycodalepis*, g. n., for *Lycodes mucosus*, Rich.; Bleeker, Versl. Ak. Amst. (2) viii. p. 369.

✓ *Paralycodes*, g. n., for *L. variegatus*, Gthr.; *id. ibid.*

Motella novæ-zelandiæ, sp. n., Hector, Tr. N. Z. Inst. vi. p. 107, Cape Campbell.

Lotella rhacinus, Forst., figured; *tom. cit.* pl. xviii. fig. 74 (diag. Hutton, Cat. Fishes N. Z. 1872, p. 46).

Ophidium. Putnam, P. Bost. Soc. xvi. pp. 339-343, gives diagnostic notices of *O. broussonetti*, Müll., *marginatum*, De Kay, *rochii*, Müll., and *vasalli*, Risso, describing *O. holbrookii*, sp. n., p. 340, from Key West, Florida.

Fierasfer. Putnam, *tom. cit.* pp. 343-346, describes a specimen of *F. homii*, Rich., and *F. dubius*, sp. n., found in the Atlantic and Pacific waters of Central America.

Echiodon drummondi, Thomps., = *Fierasfer dentatus*, Cuv., is entitled to distinct generic rank; *id. tom. cit.* p. 346.

Encheliophis tenuis, sp. n., *id. tom. cit.* p. 347, fig., from the Mediterranean (described with doubt).

✓ *Lefroyia*, g. n., closely allied to *Fierasfer*, with very prominent anal fin. Type, *L. bermudensis*, sp. n., Bermudas; M. Jones, Zool. (s. s.) 1874, p. 3837.

Haliphys guttatus, Rüpp.; diagnosis supplemented and corrected, from specimens taken near Suez. Bellotti, Atti Soc. Ital. 1874, p. 264.

MACEURIDÆ.

✓ *Macruroplus*, g. n., for *Macrurus serratus*, Lowe; Bleeker, Versl. Ak. Amst. (2) viii. p. 369.

- ✓ *Paramacrurus*, g. n., for *Lepidoleprus australis*, Rich. ; *id. l. c.* p. 370.
- ✓ *Ozymacrurus*, g. n., for *Macrurus japonicus*, Schl. ; *id. ibid.*
- Macrurus armatus*, sp. n., Hector, Tr. N. Z. Inst. vii. p. 249, pl. xi. fig. 78 A, obtained by the 'Challenger' Expedition off Cape Farewell.

PLEURONECTOIDEI.

- ✓ REICHERT, C. B. Ueber den asymmetrischen Bau des Kopfes der Pleuronectiden. Arch. Anat. Phys. 1874, pp. 196-216, pls. v. & vi., and SB. Nat. Fr. 1874, pp. 86-89.

Pseudorhombus boops, sp. n., Hector, Tr. N. Z. Inst. vii. p. 249, pl. xi. fig. 82 A, obtained by the 'Challenger' Expedition off Cape Farewell.

Rhombosolea tapirina, Gthr., re-described ; *R. tapirina*, Hutton, Tr. N. Z. Inst. v. p. 268, is a different species, and is named *retiararia*. Hutton, *op. cit.* vi. p. 106, pl. xix. fig. 83 C.

Solea melanochira, sp. n., Moreau, R. Z. (3) ii. p. 115, pl. xv. figs. A, B, C, Arcachon.

PHYSOSTOMI.

SILURIDÆ.

P. PANCERI : on albinism in *Clarias anguillaris*, &c., Rend. Acc. Nap. Sept. 1873.

- ✓ *Gastromyzon*, g. n. (Homalopterin). A great number of rays in the ventrals, which are united into a suctorial disk. *G. borneensis*, sp. n., Günther, Ann. N. H. (4) xiv. p. 454, Borneo.

Macrones colvilli, sp. n., *id. tom. cit.* p. 36, pl. viii. Bagdad.

✓ *Chimarrichthys* [||, Haast, *suprà Trachinidæ*] *davidi*, g. & sp. nn., Sauvage, R. Z. (3) ii. p. 332, Thibet.

- ✓ *Oreias*, g. n. No adipose. Dorsal nearly opposite ventrals, spineless and very short. Nasal openings close together, the anterior with a valve. Head flattened, not cuirassed. Body naked, cylindrical. Four barbels at middle of upper jaw, one on each side of the angle of the jaws; no nasal barbels. Mouth inferior, opening triangular, without teeth. Pectorals and anal without spines, the latter very short and posteriorly placed. *O. dabryi*, sp. n., D. 10, A. 9, Eastern Tibet ; Sauvage, *tom. cit.* p. 334.

Trichomycterus pardus, sp. n., Cope, P. Ac. Philad. 1874, p. 132, Upper Amazons.

Bunocephalus melas, sp. n., *id. ibid.* Nauta, Peru.

- ✓ *Dysichthys*, g. n. Like *Bunocephalus*, but no mandibular or chin barbels. Head depressed, but deeper than narrow tail. *D. coracoideus*, sp. n., *id. tom. cit.* p. 133, Nauta.

Zathorax nauticus[-*tanus*], sp. n., *id. ibid.*, Nauta.

Rhinodoras prianomus, sp. n., *id. tom. cit.* p. 134, Nauta.

Liposarcus jeanesianus and *L. scrophus*, spp. nn., *id. tom. cit.* pp. 135 & 136, Nauta.

Plecostomus virescens, sp. n., *id. tom. cit.* p. 137, Upper Amazons.

Agenius pardalis, sp. n., Lütken, Vid. Medd. 1874, p. 190, Caraccas. *Silurus militaris*, Bl., and *Agenius militaris*, Val., appear to be different species; *id. ibid.*

Pseudariodes pantherinus, sp. n., p. 192, Caraccas. The differences between *P. clarias* from Surinam and *P. albicans* from the La Plata river are tabulated. This genus has been wrongly re-united with *Piramutana*, pp. 194–199. Lütken, *tom. cit.*

Pimelodus. Remarks on the characters of the restricted genus and description of two new species, *P. valenciennesi* (Kröyer) and *P. labrosus* (Kr.) from the La Plata river. Lütken, *tom. cit.* pp. 200–205.

Galeichthys peruvianus, sp. n., Callao. The males of this genus probably carry the ova in their mouths like those of *Arius*. *Id. tom. cit.* pp. 16–18.

Arius jatus, H. Buch., has palatine teeth: its characters defined, p. 207. *A. argenteus* (Kr.), sp. n., Canton, and remarks upon the lines of pores in the *Ariinae*, pp. 211–225. *Id. tom. cit.*

Hemibagrus macropterus, Bl., = *Macrones (Hypselobagrus) elongatus*, Gthr., juv. The locality of Singapore stated to be doubtful. *Id. tom. cit.* p. 215.

Macrones (Hemibagrus) menoda, H. B., ? = *Bagrus trachacanthus*, Val., re-described; *id. tom. cit.* p. 216.

CYPRINIDÆ.

Capoeta steindachneri, Kessl., re-described and figured by Kessler, in Fedchenko's Turkestan Journey, ii. pt. 6, p. 7, pl. i. figs. 3 & 4.

Barbus conocephalus, Kessl., p. 9, pl. i. figs. 5 & 6; *B. lacertoides*, K., p. 10, and *B. brachycephalus*, K., p. 11, pl. ii. figs. 7 & 8, are re-described by Kessler, *l. c.*, and *B. platyrostris* [latir-], sp. n., *id. l. c.* p. 54, pl. viii. fig. 38; Turkestan.

Schizothorax aksaiensis, K., p. 12, *fedtschenkoi*, K., p. 13, pl. ii. figs. 9 & 10, *affinis*, K., p. 14, and *eurystomus*, K., p. 15, pl. ii. fig. 11, are re-described by Kessler, *l. c.*

Schizothorax orientalis and *argentatus*, spp. nn., Kessler, *l. c.* pp. 54 & 55, Turkestan.

Diptychus sewerzowi, K., re-described and figured, p. 17, pl. iv. fig. 14, and *D. dybowskii*, sp. n., p. 55, pl. viii. fig. 39, Kessler, *l. c.*

Acanthobrama kuschakewitschi, K., re-described and figured by Kessler, *l. c.* p. 22, pl. iv. fig. 15.

Alburnus iblioides, K., and *teniatus*, K., re-described pp. 25 & 26, and *A. fasciatus*, Nordm., figured by Kessler, *l. c.* p. 26, pl. iv. fig. 17.

Aspius esocinus, sp. n., Kessl., *l. c.* p. 28, pl. v. fig. 8, Turkestan.

Squalius intermedius, K., p. 31, pl. v. fig. 19, and *S. squaliusculus*, K., p. 32, pl. v. fig. 20, re-described and figured by Kessler, *l. c.*

Cobitis longicauda, K. p. 38, pl. vi. figs. 22 & 23, *C. uranoscopus*, K., p. 40, pl. vi. figs. 24 & 25, and *C. dorsalis*, K., p. 42, pl. iv. figs. 26 & 27, re-described and figured by Kessler, *l. c.*, and *C. elegans*, sp. n., *id. l. c.* p. 43, Turkestan.

- ✓ *Diplophysa*, g. n., allied to *Botia*, Gray, but differing in wanting the movable spine on the infra-ocular bones. *D. strauchi* and *D. labiata*, Kessler, l. c. pp. 57-59, pl. viii. fig. 40, & pl. viii. fig. 41, Turkestan: spp. nn.

Cyprinus auratus. Notes on the pathological development of the eye in the Telescope Fish (a monstrous variety of the gold fish); G. Camuset, C. R. lxxviii. p. 198.

Barbus (or *Systomus*) *luteus*, Heck., should be removed to *Barynotus*; *Luciobarbus xanthopterus*, Heck., and *L. mystaceus*, H., are individual variations of *Barbus scheich*, Heck.; *Barbus grypus*, Heck., probably = *B. kotschii*, H.: A. Günther, Ann. N. H. (4) xiv. p. 37.

Barbus sharpeyi, id. tom. cit. p. 38, pl. ix. Bagdad; *B. reinii*, pl. xiii., *fritschii*, pl. xiv. A, p. 231, and *nasus*, p. 232, pl. xiv. B, Morocco, id. op. cit. xiii.: spp. nn.

Barbus hexagonolepis, M'Cl., is distinct from *B. hexastichus*, M'Cl.; Day, J. A. S. B. (n. s.) xliii. pt. 2, p. 32.

- ✓ *Sinibarbus*, g. n. Lateral line complete, reaching middle of caudal; scales rather large. Dorsal opposite ventrals, with a dilated osseous ray. Anal short. Muzzle rounded; mouth transverse; 2 barbels. Pharyngeal teeth, 5 in a single row, hooked and recurved. *S. vittatus*, sp. n. (d. $\frac{3}{8}$, a. 7, l. lat. 40). Western Tchikiang, Sauvage, R. Z. (3) ii. p. 335.

Labeo (not *Cirrhitina*) *dyochilus*, M'Cl., diagnosis given; Day, l. c.

Minomus platyrhynchus and *jarovii*, spp. nn., Cope, P. Am. Phil. Soc. xiv. pp. 134 & 135, Provo.

Ceratichthys ventricosus, sp. n., id. l. c. p. 136, Arizona.

Myloleucus parovanus, sp. n., id. *ibid.*, Beaver river.

Catostomus alticolus, sp. n., id. l. c. p. 138, Colorado.

- ✓ *Heteroleuciscus*, g. n. Body covered with large scales. Lateral line complete, reaching to middle of caudal. Dorsal short, without hard ray, opposite ventral. Anal very short, with 5 branched rays. Lower jaw not trenchant; a barbel at angle of mouth; pharyngeal teeth in two series, 5 & 3, recurved in a hook. Mouth anterior. Intermaxillary not protractile. Isthmus narrow; junction of branchial membrane with isthmus a little behind eye. *H. jullieni*, sp. n. (d. 10, a. 7, l. lat. 26-28), Sauvage, tom. cit. p. 339, Cochinchina.

Plagopterinæ. Under this name, Cope, l. c. pp. 129-131, distinguishes *Meda*, Gir., and the two new genera next mentioned, from their possession of two strong osseous dorsal rays; some of the ventral rays are similarly ossified.

- ✓ *Plagopterus*, g. n. Differs from *Meda* in the presence of barbels, and the inner dental series being 5-4 instead of 4-4. *P. argentissimus*, sp. n., id. l. c. p. 130, Western Colorado.

- ✓ *Lepidomeda*, g. n. Differs from *Meda* and *Plagopterus* in the presence of scales. *L. vittata* and *L. jarovii*, spp. nn., id. l. c. p. 131, Arizona.

Clinostomus tania and *C. phlegethontis*, spp. nn., id. l. c. p. 133, Utah.

Rhinichthys henshawii, sp. n., id. *ibid.*, Provo.

Hybopsis timpanogensis, sp. n., id. l. c. p. 134, Provo & Gunnison.

CHARACINIDÆ.

The following new species are described by Lütken from Minas Geraes, Central Brazil, in Overs. Dan. Selsk. 1874, No. 3:—

Curimatus albula, p. 127.

Prochilodus affinis, p. 128.

Leporinus reinhardti, p. 129, *L. tæniatus*, p. 129, *L. marcgravi*, p. 130.

Tetragonopterus cuvieri, *lacustris*, *rivularis*, *gracilis*, *nanus*, pp. 131–134.

Chirodon piaba, p. 134.

Brycon reinhardti, p. 134, *lundii*, p. 135.

Xiphorhamphus lacustris, p. 136.

Serrasalmo brandti, p. 137.

Myletes (Tometes) micans, p. 137.

✓ *Leporellus*, g. vel subg. n., Lütken, l. c. p. 129. Differs from *Leporinus* proper in its approximated nostrils, deeply cleft branchial orifices, branchiostegal membrane not attached to the lower surface of the head (in which characters it approaches the *Tetragonopterini*), and in the partially scaled lobes of the caudal fin. Type, *Leporinus pictus*, Kner (*L. vittatus*, Val. ?), Rio das Velhas.

Several species from Trinidad re-characterized; *Corynopoma searlesi*, Gill, figured; *Tetragonopterus trinitatus*, Ltk., is a *Hemibrycon*, and *T. pulcher*, Gill, a *Chirodon*. Lütken, Vid. Medd. pp. 220, 223, 234 & 236.

Chirodon. Revised diagnosis; *id.* Overs. Dan. Selsk. 1874, p. 134.

Tetragonopterus. The spines on the ventrals and anal of individuals are not characteristic of the entire genus; *T. erstedii*, sp. n., *id.* Vid. Medd. p. 229, River San Juan.

Serrasalmo (Pygocentrus) notatus, sp. n., *id.* l. c. p. 238, Venezuela.

Prochilodus asper, sp. n., *id.* l. c. p. 226, Venezuela.

Chalcinus paranensis, sp. n., Günther, Ann. N. H. (4) xiv. p. 454, River Parana.

CYPRINODONTIDÆ.

Haplochilus floripinnis, sp. n., Cope, P. Am. Phil. Soc. xiv. p. 138, Colorado.

Fundula cyprinodonta, Cuv. On the breeding habits observed in captivity; P. Carbonnier, Bull. Soc. Acclim. (3) 1874, pp. 665–671.

Fundulus bermudæ, sp. n., Günther, l. c. p. 370, Bermudas.

Molinesia jonesi, sp. n., *id.* l. c. p. 371, Alcohuaça, Mexico.

Xiphophorus, Heck. H. Weyenbergh describes and figures the sexual organs and early stages of this genus, adding *X. heckeli*, sp. n., from the Primero river; Versl. Ak. Amst. (2) viii. pp. 291–307, pls. i. & ii. figs. 1–31.

STERNOPTYCHIDÆ.

Maurolicus australis, sp. n., doubtfully separated from *M. borealis*. Hector, Tr. N. Z. Inst. vii. p. 250, pl. xi. fig. 90 D, Milford Sound and Cuttle Cove, New Zealand.

✓ *Diplophos*, g. n. Body very elongate, riband-shaped, with large thin

deciduous scales; a double series of phosphorescent spots along the lower edge of the body and tail; head long, compressed with pointed snout and projecting lower jaw, gape very wide; both jaws with a single row of pointed teeth, somewhat unequal in size but none specially developed, palate toothless? Eye moderate; paired fins well developed, dorsal behind ventrals, above vent; apparently no adipose fin; anal very long. Type, *D. tenia*, sp. n., Günther, J. Mus. Godeffr. ii. [1873] pp. 101 & 102, fig., Mid-Atlantic.

SALMONIDÆ.

GOETTE, —. Ueber den Keim des Forelleneies. Arch. mikr. Anat. ix. p. 679.

On the germ of the Trout-ovum.

Salmo salar. Lunel, Hist. Nat. Poissons Lém., does not consider the reproduction of this species in Lake Lemman as sufficiently authenticated; he gives an account of the various efforts that have been made to introduce it, pp. 127–130, and describes and figures the following as properly belonging to the Lemman fauna:—*Coregonus fera*, Jurine, pp. 106–114, pl. xi.; *C. hiemalis*, Jurine, pp. 114–120, pl. xii.; *Thymallus vulgaris*, Nilss., pp. 120–126, pl. xiii.; *Salmo umbla*, L., pp. 130–138, pls. xiv. & xv., tabulating the characters of *Salmo fario ausonii*, *S. lemanus*, *S. rappii*, *S. lacustris*, and the Trout of Lemman, which he describes and figures under the name of *Trutta variabilis*, pp. 146–160, pls. xvi., xvii. & xviii.

Salmo oxianus, sp. n., Kessler, in Fedchenko's Turkestan Journey, ii. pt. 6, p. 35, Turkestan.

On *Terata mesodidyma* of *Salmo salvelinus*. Cellacher, SB. Ak. Wien, lxxviii. pt. 2, pp. 299–325, 3 plates.

A. G. Reed on cause of blindness in salmon, P. Ac. Philad. 1874, p. 216.

Salmo hoodi, Rich. Two young specimens from Sabine Island are doubtfully referred to this species. Peters, Zweite Deutsche Nordp.-fahrt, p. 174.

Coregonus generosus, sp. n., id. MB. Ak. Berl. 1874, p. 791, fig., Mark Brandenburg.

GALAXIIDÆ.

Galaxias grandis, Haast, = *brevipinnis*, Gthr.; Hutton, Tr. N. Z. Inst. vi. p. 107.

MORMYRIDÆ.

✓ *Campylomormyrus*, g. n., for *Mormyrus tamandua*, Gthr., and *Oxymormyrus*, g. n., for *M. zanclostris*, Gthr.; Bleeker, Versl. Ak. Amst. (2) viii. p. 367.

✓ *Stenomormyrus*, g. n., for *Mormyrus niloticus*, Bl., Schn.; id. tom. cit. p. 368.

ESOCIDÆ.

Esox lucius, L., described and figured; Lunel, *op. cit.* pp. 161-171, pl. xix.

CLUPIDÆ.

Engraulis chefuensis, Günther, Ann. N. H. (4) xiii. p. 158, Chefoo, and *E. olidus*, id. *op. cit.* xiv. p. 455, River Parana; *E. chcerostomus*, G. Brown Goode, Am. J. Sci. (3) viii. p. 125, Bermudas: spp. nn.

MURÆNOIDEI.

C. Dareste, 'Monographie de la famille des Poissons anguilliformes,' reduces the species considerably, recognizing only 4 of *Anguilla*, and 4 of *Conger*; C. R. lxxix. pp. 988-990.

Dr. Syrski describes and figures the reproductive organs of the eel in SB. Ak. Wien, lxxix. pt. 2, pp. 315-326, pls. i. & ii.

Leptocephalus. Haast records the appearance of a specimen of "glass eel" in New Zealand, which agreed with the Mediterranean *L. longirostris*, Kaup. Tr. N. Z. Inst. vii. p. 238.

LOPHOBRANCHII.

On the development and reproduction of *Siphonostoma typhle*, by Malm. Lund: 1874, 4to, 21 pp. 1 pl. figs. 1-6.

Syngnathus jullieni, Sauvage, R. Z. (3) ii. p. 338, Cochin China; *S. jonesi*, Günther, Ann. N. H. (4) xiv. p. 455, Bermudas: spp. nn.

Hippocampus. Note on the mode in which the females introduce the eggs into the ovigerous purse of the males; F. Fanzago, Atti Soc. Pad. 1874, p. 161.

On the muscles of the dorsal fin; L. Ranvier, Arch. Phys. (2) i. pp. 16-18, pl. i. figs. 6 & 7.

An account of experiments testing the degree of sensational faculty of the *Hippocampus*, and establishing the prehensile powers of the tail; Dufossé, J. de l'Anat. Phys. 1874, pp. 368-375.

PLECTOGNATHI.

Balistes (Canthidermis) calolepis, Hollard, re-described and figured; stated to be distinct from *B. auromarginatus*, Benn. Bleeker & Pollen, Faune de Madag. pt. 4, p. 3, pl. ii. fig. 2.

Monacanthus septentrionalis, sp. n., Günther, Ann. N. H. (4) xiii. p. 158, Chefoo.

CYCLOSTOMATA.

Langerhans has published a monograph on *Petromyzon planeri*, describing the differences between the larval and adult states and the successive development of the different organs. Freiburg: 1873.

LEPTOCARDII.

Amphioxus may be the young stage of *Myxine*. Putnam, P. Bost. Soc. xiv. (1871) p. 355.

On the chorda of *Amphioxus*; R. Kossmann, Verh. Ges. Würzb. vi. pp. 82-93, pl. iv.

✓ *Protistius*, g. n. (? *Mugilidæ*, ? *Cyprinodontidæ*). First dorsal represented by a single rudimental spine, second a little behind first anal rays. Ventrals present. L. lateral rudimental. Mouth bordered above by pre-maxillary only, which supports a band of rather large bristle-like teeth, those of the outer series the largest. Dentary bones with strong symphysis, and band of teeth like those of pre-maxillary. Swim bladder present; alimentary canal short, simple. *P. semotilus*, sp. n., Cope, P. Ac. Philad. 1874, p. 66, Peruvian Andes.

MOLLUSCA.

BY

PROF. EDUARD VON MARTENS, M.D., C.M.Z.S.

THE GENERAL SUBJECT.

ARADAS, A., & BENOIT, L. Conchiglie viventi marine della Sicilia. Pt. ii. [pt. i., 1870.] Messina: 1874, figs.

BERCHON, DE FOLIN, & PÉRIER. Les fonds de la mer. Paris: 8vo.

A second volume of this useful work, containing descriptions and good figures of new species dredged in various points of the world, has been published. Some quotations from it will be found below.

BERGH, R. [See SEMPER.]

BINNEY, W. G. Notes on American Land Shells, and other miscellaneous conchological contributions. Burlington: 1874, 8vo.

Vol. i. contains conchological papers by the author previously published in P. Ac. Philad. and Ann. Lyc. N. York in 1856-1873, in all, 343 pp. Vol. ii., pt. 1; On the anatomy and lingual dentition of *Ariolimax* and other *Pulmonata*, published in P. Ac. Philad. 1874, pp. 32-63, pls. ii.-xi. Vol. ii., pt. ii.; On the genitalia and lingual dentition of *Pulmonata*, published in Ann. Lyc. N. York, xi. 46 pp. with 6 pls.

BLAND, T., & BINNEY, W. G. On the lingual dentition and anatomy of *Achatinella* and other *Pulmonata*. Ann. Lyc. N. York, x. [1873, actually Feb. 1874], pp. 331-350, pls. xv. & xvi.

N.B. Forms a part of the first volume of Binney's "Notes."

BRUGNONE, —. Miscellanea Malacologica, 1873.

CALKINS, N. W. The land and fresh-water shells of La Salle County, Illinois. P. Ottawa Ac. 1874, 48 pp. 1 pl.

CARPENTER, P. On the generic affinities of the New England Chitons. Ann. N. H. (4) xiii. pp. 119-123.

CLESSIN, S. Ueber Missbildungen der Mollusken und ihrer Gehäuse. JB. Ver. Augsb. xxii. pp. 23-107.

—. Die Gruppe *Fruticicola* des genus *Helix*. JB. mal. Ges. i. pp. 177-194, 305-336, pls. viii. xii. & xiii.

—. Beiträge zur Molluskenfauna Südbayerns. Nachr. mal. Ges. 1874, pp. 19-23.

- CLESSIN, S. Beitrag zur Molluskenfauna der oberbayrischen Seen. CB. Ver. Regensb. xxvii. [1873] pp. 56-179.
- Die Familie der Najaden. Mal. Bl. xxii. pp. 1-20, pl. i.
- Die Genera der recenten Süßwasser-Bivalven. MT. Ver. Reich. 1874.
- Die Jahresringe der Süßwasser-Bivalven. Nachr. mal. Ges. 1874, pp. 25-29.
- Die Muscheln der Urgebirgsformation. *Tom. cit.* pp. 87-89.
- Zur Molluskenfauna in Torfmooren. JH. Ver. Württ. xxx. pp. 164-168.
- Fossile Ammersee-Mollusken. Nachr. Mal. Ges. 1874, pp. 49-55.
- [See KÜSTER.]
- CROSSE, H. Faune malacologique terrestre et fluviatile de l'île Rodriguez. J. de Conch. xxii. pp. 221-242, pl. viii.
- & MARIE, É. Catalogue des Cônes de la Nouvelle Calédonie. *Tom. cit.* pp. 333-359, pls. xiii. & xiv.
- [See FISCHER.]
- DALL, W. H. Catalogue of Shells from Behring's Strait and the adjacent portions of the Arctic Ocean, with descriptions of 3 new species. P. Cal. Ac. (Separate print, in advance, Feb. 1874, 7 pp.)
- DESHAYES, G. P. Description de quelques espèces de Mollusques nouveaux ou peu connus envoyés de Chine par M. l'Abbé David. Bull. N. Arch. Mus. ix. 14 pp. 3 pls.
- DESMARS, J. Essai d'un Catalogue méthodique et descriptif des Mollusques terrestres, fluviatiles et marins observés dans l'Ile et Vilaine, les départements limitrophes de l'Ouest de la France, et sur les côtes de la Manche de Brest à Cherbourg. Redon: 1873, 8vo, 94 pp.
- Only the first part, containing the land and fresh-water mollusks, has been issued, as far as the Recorder knows.
- FISCHER, PAUL Faune conchyliologique marine du département de la Gironde. 2^{me} supplément. Act. Soc. L. Bord. xxix. pp. 151-213.
- & CROSSE, H. (Mission scientifique au Mexique et dans l'Amérique Centrale. Recherches Zoologiques: 7^{me} partie.) Études sur les Mollusques terrestres et fluviatiles, 4^{me} livraison, pp. 385-465, pls. xvii.-xx. Paris: 1874, folio.
- FLEMMING, W. Ueber die ersten Entwicklungserscheinungen am Ei der Teichmuschel. Arch. mikr. Anat. x. pp. 257-293, 16 pls.
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- . [See KÜSTER.]
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1874. [VOL. XI.]

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ANATOMY, PHYSIOLOGY, AND EMBRYOLOGY.

H. GRENACHER maintains that what is called the foot in the *Mollusca*, consists morphologically of two essentially different parts—the *propodium*, which is single from the beginning, and the *epipodium*, which is originally formed by a pair of prominences. The epipodium is transformed in the Cephalopods to the funnel, in the Pteropods to the lateral fins. No trace of propodium is to be found in the Cephalopods; their arms probably correspond to the velum of other *Mollusca*. *Z. wiss. Zool.* xxiv. pp. 567–577.

The peculiar nervous organ detected by Lacaze-Duthiers in the *Limnæidæ* [see *Zool. Rec.* ix. p. 161] is regarded as olfactory by Von IHERING, from its analogy with a similar one in the Pteropods and Heteropods. *JB. mal. Ges.* i. p. 166.

On “fungoid” growth in the shells of Mollusks. M. STIRRUP, *P. Soc. Manch.* xi. (1872) p. 137.

Copper in the blood of *Helix nemoralis* and *pomatia*. SIEGERT, *Ber. Ges. Chemnitz*, iv. (1873) p. 69.

Decrease of weight in *Helix pomatia* during winter; SIEVERS, *SB. Ges. Dorp.* iii. p. 299.

Notes on spermatozooids of *Helix pomatia*, *Clausilia biplicata*, and *Cyclos cornea*; LA VALETTE, *Arch. mikr. Anat.* x. pp. 495–504, pl. xxxv.

The formation of the egg in the *Mollusca* is reviewed, with careful reference to the literature of the subject, by H. LUDWIG, *Arb. Inst. Würzb.* parts v. & vi. pp. 369–379 (*Verh. Ges. Würzb.* 2nd ser. vii. pp. 115–125). The author comes to the conclusions that the egg is a simple cell, representing a transformed epithelial cell, and that it is surrounded in the *Bivalvia*, *Pulmonata*, and *Cephalopoda* by a primary cover, which is to be called vitelline membrane (Dotterhaut), and further in all *Mollusca* by a secondary soft cover, secreted in the *Gastropoda* and *Cephalopoda* by peculiar glands or by the walls of the oviduct, whereas in the *Bivalvia* its origin is not yet exactly known.

E. RAY LANKESTER, from his observations on the development of various genera, concludes that in all young Mollusks there is a peculiar secreting organ, formed by invagination of the dorsal surface, and to be called *shell-gland*; in some genera it secretes a chitinous matter, which eventually disappears, in others it gives origin to a true internal shell, as in *Sepia* and *Limax*. The embryo of the *Mollusca* ordinarily undergoes three stages:—the first, that of a *Gastrula*; the second, when girdled with a row of cilia, is called *Trochosphæra*; and the third, distinguished by the development of the velum, *Veliger*. *Q. J. Micr. Sci.* (2) xiv. pp. 365–391, pls. xvi. & xvii. The author also states that he has observed the typical *Gastrula*-stage in Pectinibranchiate Gastropods (*Paludina*), Nudibranchs (*Tergipes*, *Polycera*), Pulmonates (*Limax*, *Limnæa*), and Bivalves (*Pisidium*). *Ann. N. H.* (4) xiv. pp. 81–86 & 458–460; also in *P. R. Soc.* xxii. pp. 232–238.

On development of Cephalopods and Pteropods, *Limnæa*, *Calyptrea*, and *Anodonta*, see *infra*.

Some notes on perforating Mollusks by W. C. MacINTOSH, *Ann. N. H.* (4) xiii. pp. 344 & 345.

The influence of granitic soil on the shell of Mollusks is discussed; not only *Margaritana margaritifera*, but also *Unio batavus*, *Neritina*, and *Lithoglyphus*, have a very thick and much eroded shell, but *Ancylus* is unusually thin in the streams of the granitic part of South Eastern Bavaria; S. CLESSIN, *Nachr. mal. Ges.* 1874, pp. 87-89.

Balea perversa and *Cionella lubrica* active on 20th January, at Kiel; W. FACK, *Schr. Ver. Schlesw. Holst. i.* pp. 277 & 278.

Stenogyra martensi (Strobel) survived immersion in water for 48 hours; STROBEL, *Malac. Argent.* p. 29.

Observations on freshwater Mollusks in infected water, by GÉRARDIN, *J. de Conch.* xxii. p. 332; *Cyclas*, *Pisidium*, and *Planorbis corneus* resist its effects more than *Limnaea*.

Teratology.

S. CLESSIN (*JB. Ver. Augsb.* xxii. pp. 23-107) has published a treatise on the deformities of Mollusks and their shells, in which he has collected a large amount of observations, made by himself and others (chiefly Porro, Hartmann, and Moquin-Tandon); he takes rather a wide view of the subject, including, for example, the variations in the bands of many species of *Helix*. He classes the single cases in the following manner:—

I. *Monstrosities*: changes in shape of considerable amount, limited to the animal. They are caused—

1. By the individual disposition of the animal, p. 34.
2. By injury from without, mutilations, p. 36.

II. *Modifications*: changes in the shell caused by affections of the living organs from without.

a. Founded more particularly on the individuality of the animal.

1. Difference of colour, p. 39.
2. Difference or want of bands, p. 52.
3. Want of colour, albinism, p. 45, and as a smaller degree of it the pale green colour of some varieties of *Hyalina*, p. 49.
4. Perversity of whorls, p. 68.

b. Founded more particularly on external circumstances.

5. Thinness or thickness of the shells, the latter often caused by abundance of calcareous matter in the soil, p. 72.
6. Weather-beaten or decaying shells.
7. Overgrowth of shells, p. 75.

III. *Anomalies*: deformities of shell by mechanical injury not affecting the animal.

1. Erosion of the shell, p. 78.
2. Injury to the shell by shock or fracture, p. 82, sometimes resulting in—
 - a. Lengthening of the spire or scalar form, p. 90.
 - b. Abbreviation of the spire, p. 100.
 - c. Displacement of the spire, p. 101.

A scalar form of *Planorbis complanatus* described by PIRÉ, *Ann. Mal. Belg.* vi. pls. iii. & iv.

GEOGRAPHICAL DISTRIBUTION.

a. LAND AND FRESH-WATER MOLLUSCA.

1. Northern and Central Europe.

G. JÄGER, in "Deutschlands Thierwelt" (Stuttgart: 1874, 2 vols. gr. 8vo), in which the animals are arranged according to the different localities in which they are found, refers to Mollusks as follows:—vol. i. p. 94, larvæ of beetles found in snail shells; p. 101, snails of mountainous counties; pp. 288 & 314, those of the woods; p. 382, those of plantations and hedges; ii. p. 39, snails of the open soil; p. 57, those found between and under stones; p. 116, those living on stone walls; p. 222, in cellars; p. 271, fresh-water shells found between water-plants; pp. 333 & 339, fresh-water bivalves.

Courland. 110 land and fresh-water shells observed by BERG; CB. Ver. Riga, xx. (1873) p. 105.

Island of Bornholm. 41 terrestrial and 31 fresh-water species enumerated by C. M. POULSEN, Vid. Medd. 1873, Nos. 13 & 14 [really in 1874] pp. 189–201; of these, 15 and 14 respectively are spread throughout the island, 12 and 9 are peculiar to the granitic, and 14 and 11 to the other part of the island. *Clausilia plicata* (Drap.) is very common. *Pupa umbilicata* may also be mentioned. The genus *Anodonta* is represented, but neither *Unio*, *Amphipeplea*, or *Dreissena* are found, which may be accounted for by the want of large lakes and rivers.

Holstein. W. FACK enumerates 59 terrestrial and 40 fresh-water species observed by him in the northern part of that province. Schr. Ver. Schlesw. Holst. i. pp. 273–276.

Some shells collected at *Hamburg*, by H. PETERSEN, Nachr. mal. Ges. 1874, p. 13, and Verh. Ver. nat. Unterh. Hamb. i. p. 166.

H. v. MALTZAN-FEDEROW answers Wiechmann's critical remarks [Zool. Rec. x. p. 130] in a somewhat vague manner. Arch. Ver. Mecklenb. xxviii. pp. 108–110.

A. KRAUSE enumerates 44 terrestrial and 37 aquatic species of *Mollusca* found near *Bromberg*, province Posen. It results from this list, that the malacological fauna of that part of ancient Poland, hitherto unexplored, agrees very well with that of Germany; but it is very remarkable that *Helix nemoralis* and *hortensis* are replaced by *H. austriaca* (Mühlf.), as in a large part of South Eastern Europe. JB. mal. Ges. i. pp. 59–64. Some additions in Nachr. mal. Ges. 1874, p. 74.

44 terrestrial and 42 aquatic species of Mollusks found near *Magdeburg* enumerated by O. REINHARDT. Abh. Ver. Magdeb. vi. pp. 19–34.

Hartz. 57 species of terrestrial and 44 of fresh-water Mollusks observed, chiefly on calcareous soil and in woods, much rarer in the mountains of permian formation (Zechstein) and in pine forests, by RUDOW, Z. ges. Naturw. (2) v. (1873) pp. 202–223.

Some land-shells found among juniper berries collected in *Thuringia* are enumerated by WIEGMANN, Nachr. mal. Ges. 1874, p. 51.

Belgian localities for land and fresh-water Mollusks noted by G. COLLIN, J. COLBEAU, and E. VAN DER BROECK, P.-v. Mal. Belg. 1874, pp. lxiii., clxiii.-clxx., cxcix.-cc., and Ann. Mal. Belg. vii. (1873) pp. 21 & 85.

Brittany. J. DESMARS has described 93 land and 55 fresh-water Mollusks (separate pamphlet, dated December, 1873), the more remarkable among which are *Geomalacus maculosus*, *Limax gagates* and *sowerbii*, *Helix quimperiana*, *cornea*, *obvoluta*, *fusca*, *limbata*, *plebeia*, *ponentina*, *ptilota* (Bourg.), *ignota* (Mabille), *arenosa* (Ziegl.) [var. of *ericetorum* ?], *cespitem*, *danieli* (Bourg.), *pisana*, *variabilis*, *submaritima*, and *lineata*, *Clausilia rolphi*, *druoidica* (Bourg.), *armoricana* (Bourg.), *Pupa semproni*, *Physa taslii* (Bourg.), *subopaca* (Lam.), *Bythinia similis*, *Valvata minuta*, *Unio littoralis* and *requieni*, *Cyclas tervetiana* (Dnupuy), and *Dreissena polymorpha*, the last first observed in 1868.

The malacological faunæ of the environs of Paris and of the department of the *Haute-Loire*, have been treated (1873) by L. PASCAL, Arch. Miss. Sci. (3) i., abstracted in J. de Conch. xxii. pp. 399-401; he enumerates 115 species in the former, and 82 in the latter locality.

A list of land and fresh-water shells found in the granitic region of the *Vosges* mountains is given by G. COLLIN, P.-v. Mal. Belg. 1874, pp. xxvii.-xxxii.

O. REINHARDT has treated the malacological fauna of the *Sudetic Mountains* (between Silesia, Bohemia, and Moravia) from personal researches made chiefly in the "Iser-gebirge" and "Mährisches Gesenke." He enumerates 108 species, and notes for each its hypsometrical and geographical distribution. The fresh-water shells are very poor in species, and most of them occur only in the lower regions until 2000 feet above the sea; *Limnæa peregra* and the peculiar *Pisidium roseum* (Scholtz) only are found in the higher regions. In the western parts, there are some species of land-shells, which are to be considered as advanced posts of the fauna of the Eastern Alpine province, viz.:—*Helix holoserica* and *cobresiana*, *Clausilia orthostoma*, *Hyalina glabra*; in the eastern part, there are some species common with the Carpathian mountains, but not found in any other part of Germany; these are *Helix carpatica* (Friv.) and *H. faustina* (Ziegl.). In the subalpine region of the whole chain, where no tree (or only *Pinus pumilio*) grows, the following 23 species have been found:—*Arion subfuscus*, *hortensis*, *Limax cinereus*, *marginatus*, *Vitrina elongata*, *pellucida*, *Hyalina radiatula*, *pura*, *nitidula*, *fulva*, *Helix pygmæa*, *holoserica*, *arbusorum*, *Cionella lubrica*, *Pupa edentula*, *alpestris*, *arctica*, *pusilla*, *Clausilia plicatula*, *cruciata*, *parvula*, *Succinea oblonga*, var., and *Pisidium roseum*; in those elevated regions many specimens of several species are whitish or pale green, instead of brown or dark: this the author thinks is a protective consequence of the cold and foggy climate. *Pupa arctica* (Wallenberg), otherwise only known from Lapland, is analogous in its distribution to some species of Arctic plants also found in the elevated regions of the "Riesengebirge," but not in any part of the Alps. Arch. f. Nat. xl. pp. 179-259 (a part of it, concerning the "Isergebirge," also published as an inaugural thesis of the "Luisenstädtische Gewerbeschule," Berlin).

73 species of land and fresh-water shells found near *Hohemwittingen*, *Wurtemberg*, on jurassic soil, are enumerated by D. WEINLAND, *Nachr. mal. Ges.* 1874, pp. 41-46.

The malacological fauna of the lakes in *Upper Bavaria* has been examined by S. CLESSIN; many of them have somewhat peculiar forms, possibly transformations of other well known species by local influence, but others must at present be classified as peculiar species. The author distinguishes—1, high lakes or tarns (*Hochseen*), situated at a considerable height in the mountains, of small size, and very poor in Mollusks, for example, the *Schliersee* and *Tegernsee*; 2, larger lakes, surrounded by high precipitous rocks and of considerable depth, with a moderate number of Mollusks, for example, the *Königsee*, near *Berchtesgaden*; 3, large lakes with flat banks, traversed by rivers and very rich in Mollusks, many of peculiar forms; for example, the *Ammersee* and *Starnbergersee*. The number of species found in each lake is stated. *CB. Ver. Regensb.* xxvii. pp. 56, 67, 99, 114, 147 and 179.

Southern Bavaria. S. CLESSIN adds to the fauna:—*Limax variegatus*, *Hyalina draparnaldi*, *Helix rubiginosa*, *celata*, *thymorum*, *Clausilia nigricans*, *Pupa striata*, *Amphipeplea glutinosa*, *Valvata alpestris*, and *Bythinella cylindrica*. *Nachr. mal. Ges.* 1874, pp. 19-23.

19 species of Mollusks living in the peat-moors of this district are also discussed by S. CLESSIN; many of them form peculiar varieties, distinguished by dwarf size and thin shell; *Limnæa stagnalis* occurs there only in specimens with rather short spire; no *Anodonta* has been found. But in a moor (*Lindenried*, near *Essendorf*, *Wurtemberg*) traversed by clear water-springs which make their way from the ground through the peat, several other species and varieties have been found, viz., *Valvata piscinalis*, *Limnæa palustris*, var. *corvus*, *L. stagnalis*, with elongate spire, and *Anodonta rostrata*. These are also found in a fossil state in the undermost alluvial layer of the normal peat-moors; they have been evidently extinguished by the deterioration of the water. *JH. Ver. Württ.* xxx. pp. 164-176.

Switzerland. Additions to the malacological fauna of the canton of the *Grisons*, by A. STEIN, *JB. Ges. Graub.* (2) xvii. pp. 133-139. 30 species are mentioned, and albino varieties of several of them observed.

P. GODET has examined the species of *Anodonta* living in the lake of *Neufchatel* and *Morat* (*Murten*); *Bull. Soc. Neufch.* ix. pp. 145-151 (1871).

Fauna of Caves.

Hydrobia vitrea (Drap.), and a species of *Pisidium*, found living in the cave of *Falkenstein*, *Wurtemberg*; S. FRIES, *JH. Ver. Württ.* xxx. pp. 122-139 [*cf.* *Zool. Rec.* x. pp. 130 & 147].

Depths of Lakes.

F. A. FOREL has published new and interesting observations on the fauna of the depths of the lake of *Geneva*, in which living specimens of

Limnæa stagnalis, and a new species noticed *infra* have been found. Bull. Soc. Vaud. xiii. No. 72. See also Verh. schw. Ges. 1874.

2. Southern Europe.

Some land-shells collected in *Carniola*, at *Trieste*, *Varna*, and in *Wallachia*, are enumerated by G. F. JICKELI, Nachr. mal. Ges. 1874, pp. 8-11.

Land-shells found among juniper-berries collected in Italy by WIEGMANN, *tom. cit.* p. 52.

3. Northern Africa.

A. MOUSSON has enumerated and described the land and fresh-water Mollusks collected by Dr. v. Fritsch and Dr. Rein in the western part of *Morocco*, and some advanced valleys of the *Atlas*. They consist of 38 terrestrial, 12 fresh-water, and 4 submarine species, in all 54; 13 among them are widely spread on the coast of the Mediterranean Sea, 15 occur also in Algeria or in Southern Spain, 26 appear peculiar to Morocco, but more or less resemble known Spanish or Algerian species; there is no peculiar approach to the Canarian fauna nor to that of Tropical Africa. JB. mal. Ges. i. pp. 1-16, 81-107, pls. i., iv. & v.

A. HANOTEAU and A. LETOURNEUX have published a geographical work, "*La Kabylie et les contumes Kabyles*" (Paris: 1873, 2 vols. 1085 pp. 8vo.), in which the latter discusses (vol. i. p. 212) the malacological fauna, enumerating 106 terrestrial and 24 fresh-water species, including *Pupa avenacea* and *penchinatiana* new for Northern Africa, and some species new for science.

Some fresh-water shells found in the *Oases* of the *Lybian* desert by Prof. Ascherson and Zittel are mentioned by E. v. MARTENS, SB. Nat. Fr. 1874, pp. 63-65. They are:—*Ampullaria ovata*, var., *Lanistes carinatus*, *Melania tuberculata*, *Physa contorta*, and *Limnæa natalensis*. The only land-shell found by these travellers is *Bulimus pullus* (Gray); *tom. cit.* pp. 65 & 66.

C. JICKELI has published a very valuable treatise on the land and fresh-water shells of *North Eastern Africa*, founded on his own researches in Egypt and on the North Eastern borders of Abyssinia, and on all available materials in several continental public and private collections. He enumerates 197 species (107 terrestrial, 18 submarine, and 72 fresh-water). Concerning the terrestrial species, Egypt belongs to the Mediterranean province, and agrees to a remarkable degree more with Syria than Algeria; the true African fauna begins in Sennaar, many species are common with Western and South Eastern Africa, and still more will probably be found, as all these countries are as yet very incompletely explored, especially as regards the smaller species. Abyssinia has no land shell identical with any European species, but several very nearly allied to them; in the higher regions, from 7000 to 10,000 feet, only species of *Succinea* and small *Helix* [*Punctum*], and a new *Clausilia*, have been found; the region of the chandelier-like *Euphorbia*, 3500 to 5000 feet, is the home of some characteristic large species of *Vitrina* and

Subulina; in the lower parts, several species of *Buliminus* are found, identical with Indian species; these live also on the small islands of the Red Sea. Most of the submarine shells (*Auriculidae*) are also identical with Indian species. The genera and species of fresh-water shells of the African fauna prevail throughout the whole course of the Nile. Two peculiar species of *Unio* are known from Dembea Lake in Abyssinia. A new *Valvata* has been found in the Nile. Verh. L. C. Ak. xxxvii. pp. 299-318.

4. Western Asia.

The land and fresh-water shells of the south-eastern corner of *Asia Minor*, of *Northern Syria* and *Mesopotamia*, as far as the Persian Gulf, have been treated at the same time by A. MOUSSON, from the collections made by Dr. A. Schläfli, in J. de Conch. xxii. pp. 1-60, and by E. v. MARTENS, from collections made by Prof. Hausknecht, in a separate treatise, "Ueber vorderasiatische Conchylien," Cassel: 1874, 4to, 127 pp. 9 pls. The first discusses 68, and the latter 42 species from those countries, giving also an enumeration of all known species. The South European or Mediterranean fauna prevails of course on the sea coast, but characteristic representatives of it, e.g., *Helix cincta* and *Stenogyra decollata*, extend as far as Kurdistan. Most of the peculiar species of Northern Syria and Upper Mesopotamia are nearly allied to South European ones; the most characteristic are *Helix guttata* (Oliv.) and *Buliminus halepensis* (Fér.). In Lower Mesopotamia and Babylonia, the fresh-water shells prevail much over the terrestrial ones; many species are peculiar, others identical with those of Palestine; the most remarkable are some large species of *Margaritana*, two species of *Isidora* near to or identical with those of Egypt, and *Bulimus samavensis* (Mouss.), which is probably not distinct from the Indo-African *B. cænopictus*.

The known land and fresh-water Mollusks of Western Asia, from the Caucasus to Palestine and Southern Persia, are enumerated with some critical notes by the Recorder, *Vorderasiatische Conchylien*, pp. 47-69; those collected by Prof. Hausknecht in Mesopotamia and elsewhere, described, *tom. cit.* pp. 1-37, and the scanty materials of the known malacological fauna of Asia Minor discussed, pp. 39 & 40.

Turkestan. The Mollusks collected by the late Prof. Alexis Fedchenko have been described in that traveller's work [*suprà*, p. 114], by the Recorder; they are 29 terrestrial and 21 fresh-water species, besides those known from Lake Aral, which are also enumerated: some of them are well known European species, as *Hyalina nitida* and *fulva*, *Helix costata*, *Cionella lubrica*, *Pupa muscorum*, *Vertigo antivertigo*, *Succinea putris* and *pfeifferi*, and several species of *Limnæa*; and these live not only in the cultivated regions, but also in the mountains (*Pupa muscorum*, for example, has been found at a height of 9500 feet). *Helix derbentina* is the only species of the group *Xerophila*. Some species of *Buliminus* and the genus *Macrochlamys* are representatives of the Himalayan fauna. 17 terrestrial and 8 fresh-water shells are hitherto only known from Turkestan. [*Cf.* Zool. Rec. vii. p. 24.] A list of all species known from

Central Asia, including the Altai, Daouria, Afghanistan, Cashmere, Tibet, and Yunan, is given, pp. 46-57. An abstract is given by the Recorder in SB. nat. Fr. 1874, pp. 43-49.

5. Tropical and Southern Africa.

Abyssinia [see JICKELI, *suprà*].

Rodriguez. The land and fresh-water shells of this island, collected by A. Desmazures, are enumerated, and the new species described by CROSSE, J. de Conch. xxii. pp. 221-242; they contain 9 *Helicidae*, 7 *Cyclostomidae*, 1 *Planorbis*, 3 *Melaniidae*, and 4 *Neritidae*. The general appearance of the fauna is that of Mauritius, some species being identical; but the genus *Helix* is very feebly represented. The most remarkable are such widely spread Indian species as *Stenogyra gracilis* (Hutt.), *Helix similis* (Fér.), and *Melania tuberculata* (Müll.), all probably introduced.

Some notes on *South African* land shells by E. v. MARTENS, JB. mal. Ges. i. pp. 120-122.

6. Eastern Asia.

Parts 4 & 5 of HANLEY & THEOBALD'S "Conchologia Indica" contain species of the genera *Vitrina*, *Helix* (including *Nanina*, &c.), *Bulimus*, *Achatina*, sub-gen. *Electra* [*Glessula*], *Pupa*, *Ennea*, *Spiraxis*, *Streptaxis*, *Succinea*, *Limnæa*, *Planorbis*, *Ancylus*, *Lithotis*, *Camptonyx*, *Cyathopoma*, *Alyceus*, *Lithoglyphus*, *Paludina*, and *Melania*, pls. lxxxi.-c. The species not hitherto figured will be mentioned *infra*.

New species of *Plectopylis* and *Alyceus*, with notes on the localities of some known species by GODWIN-AUSTEN, P. Z. S. 1874, pp. 608-613, pls. lxxiii. & lxxiv. and J. A. S. B. (n. s.) xliii. pt. 2, pp. 145-150.

A few notes on fresh-water shells found in the salt lakes of Tibet, most of them dead, are contained in H. SCHLAGINTWEIT'S "Reisen in Hoohasien," ii. (1872) pp. 209-218, and recapitulated by the Recorder in Zool. Gart. xv. p. 71.

Several remarkable *Unionidae* found near Nankin, described by R. P. HEUDE, J. de Conch. xxii. pp. 112-118.

7. Australia and Polynesia.

The fifth catalogue of the Museum Godeffroy, Hamburgh, Feb. 1874, 2215 pp. 8 pls., although merely a list of objects for sale, contains valuable information on land and fresh-water shells collected on the islands of the Pacific and in Australia; pp. 88-103, 109, 110, & 143, and in the introduction.

Australia and New Zealand. A number of land and fresh-water shells figured, and several described as new by Edgar Smith in "The Zoology of the Voyage of H.M.S. Erebus and Terror," Mollusca, pp. 1-3, pls. i. & iv. Those species not previously figured will be noticed *infra*.

Some new terrestrial species of *North-East Australia* are described by J. BRAZIER, P. Z. S. 1874, pp. 668-670, pl. lxxxiii.

New Caledonia. New land and fresh-water shells by CROSSE; J. de Conch. xxii. pp. 97-112, 180-186, 387-396, pls. ii., iv., xii.; and by GAS-
SIES, *tom. cit.* pp. 207-216, 373-387.

Polynesia. New species of land shells by A. GARRETT, P. Ac. Philad.
1873, p. 237.

8. North America.

I. LEA has described and figured no less than 58 so-called new species from the United States, and some *Melaniidæ*, in vol. xiii. of his Observations on the *Unionidæ*, and J. Ac. Philad. viii. 1.

J. G. COOPER illustrates the geographical distribution of the banded Californian land shells (*Helix*, group *Arionta* and *Lysinoe*), by two small maps; P. Cal. Ac. v. pp. 121-124, pls. vii. & viii.

The land and fresh-water shells of La Salle County, Illinois, are the subject of a somewhat popular treatise by W. W. CALKINS, P. Ottawa Ac. 1874, 48 pp. 1 pl. *Hyalina viridula* (Menke) = *electrina* (Gould), *H. fulva* (Drap.) = *chersina* (Say), and *Physa hypnorum* (L.), may be mentioned as circumpolar species living in this country.

9. Tropical and South America.

The fourth part of FISCHER & CROSSE's "Études sur les Mollusques terrestres et fluviatiles du Mexique et de l'Amérique centrale," discusses the genera *Cylindrella*, 10 sp., *Macroceramus*, 3 sp., and *Orthalicus*, 10 sp.

Many valuable statements and corrections concerning the localities of West Indian shells are made by BLAND, Ann. Lyc. N. York, xi. pp. 72-87.

Hayti. On some land shells; CROSSE, J. de Conch. xxii. pp. 82-89, pl. iii.

Martinique. Thirty-four terrestrial, 10 fresh-water, and 7 submarine species of shells enumerated, with observations on their occurrence and the colours of the living animals, by H. MAZÉ, *tom. cit.* pp. 158-173 (see also Crosse, *tom. cit.* pp. 118 & 202).

The land and fresh-water shells of the middle and southern parts of the states of *La Plata* are the subject of a valuable little work by P. STROBEL, from his own observations; he enumerates 19 terrestrial and 28 aquatic species, with exact observations concerning their geographical, geognostical, and hypsometrical occurrence, and other interesting points. *Limax variegatus* (Drap.) is acclimatized in Buenos Ayres, where it lives chiefly in wells. *Helix lactea* (Müll.), around the town, lives on acclimatized European plants. *Unio patagonicus* (Orb.) is used generally as food by the natives. South of the Rio Negro, in Patagonia, only the following species have been found: *Bulimus sporadicus*, *Succinea meridionalis* and *chiloensis*, *Planorbis peregrinus*, *Limnæa viator*, *Chilina puelcha* and *tehuelcha*, *Hydrobia australis*, *Anodonta puelchana*, and *Unio patagonicus*. Orbigny, on the contrary, has termed Patagonian species also those which live at Bahia Blanca, in 38-39° lat. South. An abstract in Nachr. mal. Ges. ii. pp. 268-275.

DÖRING's paper on some land and fresh-water Mollusks of the Argentine States [see Zool. Rec. x. pp. 135, 170 & 171] is also published in Bol. Ac. Cordova, i.

b. MARINE MOLLUSCA.

1. Northern and Eastern Seas of Europe.

Arctic Sea. K. MÖBIUS enumerates 11 species of Marine Gastropods (including 1 Pteropod) and 9 of Bivalves found by the second German Arctic Expedition on the Eastern Coast of Greenland, lat. 73° 50' and 75° 15' N. They are all known Arctic species; including:—*Pleurotoma pyramidalis* (Ström), *Fusus propinquus* (Alder), *Cylichna cylindracea* (Penn.), and *Astarte crebricostata* (Forbes); details of the first and third of these are figured, pls. 1–3, 4–9. *Zweite deutsche Nordpolarfahrt*, ii. Zoologie, part 7, pp. 248–252. Abstract in Ann. N. H. (4) xiii. pp. 198–200.

Results of dredgings on the coast of *Southern Norway*, in 106–120 fathoms, including 3 new species of shells, by A. METZGER; JB. mal. Ges. i. pp. 146–151 [see *Trichotropidae* and *Muricide*].

New *Mytilidae* from Norway, by MÖRCH; Förh. Skand. Naturf. möte 1873, i Kjöbenhavn, pp. 374–377, or J. de Conch. xxii. pp. 174–177.

W. C. MACINTOSH gives a list of Mollusks observed at *St. Andrews*, with various interesting annotations; Ann. N. H. (4) xiii. pp. 342–357 & 420–432.

P. FISCHER has published a second supplement to his valuable conchological fauna of the *Département de la Gironde*, containing many additions and interesting general remarks on bathymetrical distribution, of which he distinguishes the following zones, giving for each a list of the more common Mollusks:—

- a. Zone littorale, between tide-marks, with different subdivisions according to the localities; the uppermost, with *Littorina neritoides* (L.), is called "subterrestre."
- b. Zone des *Laminaires*, 1–28 mètres.
- c. Zones des *Nullipores* ou de grands *Buccins*, 28–72 mètres.
- d. Zone des *Brachiopodes* et des *Coraux*, 72–184 mètres, in the "fosse du cap Bréton."
- e. Zone des *Brissopsis*, 188–375 mètres, shells small and pale-coloured.
- f. Zone des *Verticordia*, 375–2500 mètres.
- g. Zone des abysses, 2500–4500 mètres not yet explored in the Bay of Biscay. Act. Soc. L. Bord. xxix. pp. 151–213.

J. G. HIDALGO has continued his work on the marine Mollusks of Spain, discussing the genera *Cancellaria*, *Ranella*, *Ovula*, *Purpura*, *Argonauta*, *Actæon*, and *Cypræa*.

List of shells dredged at *Tripoli* by W. B. Carpenter, on board the "Shearwater," determined by JEFFREYS; J. de Conch. xxii. pp. 134 & 135.

L. STALIO has given a somewhat minute historical account of all books and pamphlets bearing on the conchology of the Adriatic Sea, including a systematic list of all species, with indication of the author by whom,

and the year in which, they were first stated to live in the Adriatic. He attributes some exotic shells to that sea, through inaccurate determinations by former authors (*Artemis prostrata*, *Psammobia cærulescens*, &c.); Atti Ist. Venet. (4) ii. & iii. 185 pp.

The known sea-shells from the *Syrian* coast, chiefly from the collection made by Prof. Hausknecht, enumerated by E. v. MARTENS, *Vorderasiat. Conchylien*, pp. 88-91; they agree fully with those from more western coasts of the Mediterranean.

Black Sea. The known Mollusks enumerated, with some historical and critical notes by E. v. MARTENS, *op. cit.* pp. 69-79. Nearly all are identical with Mediterranean species, but many of the latter are wanting in the Black Sea, as stated by Aristotle; the facies of the fauna agrees remarkably with that of the environs of Venice. A few Caspian species are also found in the Black Sea.

Caspian Sea. The known Mollusks, from the collections of Prof. Hausknecht, Dr. Orth, and others, enumerated by E. v. MARTENS, *op. cit.* pp. 80-88. Its fauna is very peculiar, characterized by the subgenera *Didacna* and *Monodaena* of *Cardium*, and by the genus *Adacna*; the species common with other parts of Europe are either estuarian and eurythermal, as *Hydrobia stagnalis* and *Cardium edule*, or even freshwater, as *Paludina* and *Dreissena*.

2. Mediterranean Sea.

The knowledge of the rarer and small shells of the Mediterranean Sea has been remarkably advanced by the diligent researches of the Marchese T. A. DI MONTEROSATO of Palermo, who has published a paper on the shells dredged by himself at Cape S. Vito, in Sicily, containing 232 species (many very rare, and some new or known hitherto only in a fossil state), with valuable rectifications of synonymy. *J. de Conch.* xxii. pp. 243-282.

The papers by BRUGNONE and ARADAS & BENOIT, indicated in the list of titles [*suprà*, p. 111], the Recorder regrets not to have seen; some species described in them are mentioned below from quotations by Monterosato.

JEFFREYS' paper on the Mollusks of the Mediterranean Sea [*Zool. Rec.* x. p. 137] has been translated into German by KOBELT; *JB. mal. Ges.* i. pp. 337-344.

KOBELT has also published some interesting notes on rare shells of the Mediterranean Sea; *tom. cit.* pp. 107-115, 222-235, & 344-352, pls. iii., xi., xiv. [see below, *Solarium*, *Mathilda*, *Coralliophila*, *Mitra*, and *Tritonium*].

3. Eastern Coast of North America.

A. E. VERRILL has published the results of recent dredging expeditions on the Coast of New England: *Am. J. Sci.* (3) v. (1873) pp. 1-16, 98-106; vi. (1873) pp. 435-441; vii. pp. 38-46, 131-138, 405-414, 498-505. J. F. WHITEAVES records his own dredgings in the Gulf of St. Lawrence, *op. cit.* vii. pp. 1-9. Lists of shells are to be found, *op. cit.*

v. pp. 15 & 101; vi. pp. 439 & 440; vii. pp. 8, 9, 39, 43, 46, 132, 135, 409, 412, & 503. VERRILL states (pp. 134 & 135) that Quahog Bay in Maine, produces *Venus mercenaria* (L.), and quite a number of other southern species, which have the same remarkable distribution, being absent along the rest of the northern shore of New England and re-appearing in the Gulf of St. Lawrence.

New marine shells from the West Coast of *Florida* by STEARNS; P. Ac. Philad. 1873, pp. 301 & 344.

4. *Southern Atlantic.*

Some marine shells, from *Southern Brazil*, discussed by W. KOBELT, Nachr. mal. Ges. 1874, pp. 57-59.

Some sea shells, from the *Magellan Straits* and *Patagonia*, enumerated by TAPPARONE-CANEFRI, Malac. viagg. Magenta, pp. 157.

Collections of *South African* sea shells made by Dr. G. FRITSCH and others have been examined by E. v. MARTENS, who gives from them some additions and corrections to Prof. KRAUSS' well-known work on the South African *Mollusca*, comparing the fauna of the individual localities, among which the south-western, from Saldanha Bay to Cape Agulhas, are chiefly distinguished by large species of *Patella* and several small rose-coloured *Trochi*; in Port Natal, the fauna of the Indian Sea begins. Australia agrees with Southern Africa in many genera, but the species supposed to be common to both fauna are either members of the Indian fauna, only touching the borders of South Africa and Australia, or wrongly attributed to one of the two territories. JB. mal. Ges. i. pp. 119-146.

5. *Indian Ocean.*

New sea shells by G. & H. NEVILL, J. A. S. B. (n.s.) xliii. pt. 2, pp. 21-30, pl. i.; LIÉNARD, J. de Conch. xxii. pp. 70; CROSSE, tom. cit. pp. 74 & 75.

Persian Gulf. The known shells, chiefly from the collection of Prof. HAUSKNECHT, are enumerated by E. v. MARTENS, Vorderasiat. Conchylien, pp. 91-106 & 127. They agree, for the most part, with those of the Indian Sea, and still more with those of the Red Sea; a few are peculiar, and some new.

A number of shells collected at *Singapore*, *Java*, and *Hongkong* are enumerated by TAPPARONE-CANEFRI; Malac. viagg. Magenta, pp. 155 & 154.

6. *Seas of Australia.*

Many marine shells from Australia, with exact localities, enumerated in the fifth Catalogue of the Museum Godeffroy, Hamburg, pp. 104-164.

Numerous sea shells from *New Zealand*, partly not yet figured, are represented by Edgar Smith; Moll. Voy. Ereb. & Terr., pp. 3-7, pls. i.-iii., several from types long ago described by Gray. A few observations on the resemblance of the fauna of New Zealand to those of Southern Africa, Southern America, and the Pacific generally, by the Recorder; SB. nat. Fr. 1874, pp. 5 & 6.

7. *Tropical Pacific.*

Important contributions to the knowledge of the Polynesian fauna are to be found in the lists of *Mollusca* offered for sale in the 5th Catalogue of the Museum Godeffroy, Hamburg, pp. 87 & 103-181.

New Caledonia. New sea shells by SOUVERBIE & MONTROUZIER ; J. de Conch. xxii. pp. 187-201, pl. vii. : and LAMBERT, *tom. cit.* p. 374.

New Polynesian sea shells by GARRETT, P. Ac. Philad. 1873, pp. 209 & 233, pls. ii.-iv. ; and by A. BAIRD in J. L. Brencley's "Jottings during the Cruise of H.M.S. Curaçao among the South Sea Islands in 1865" (London : 1873, 8vo), pp. 432-454, pls. xxxvi.-xlii.

8. *Northern Pacific.*

C. E. LISCHKE has published a third part or second supplement to his very valuable work on the sea shells of Japan [*cf.* Zool. Rec. vi. p. 529, and viii. p. 129], chiefly from materials coming from the Bay of Yeddo, containing remarkable additions to, and some modifications of, the hitherto known conchological fauna ; *Buccinum leucostoma*, sp. n., may be named as most interesting. In the introduction, the species hitherto only known from Japan, and the species common with other geographical provinces, are enumerated in separate lists ; with the result that, out of 413 species discussed in the whole work, somewhat more than one-third are (hitherto) only known from Japan, about three-sevenths also from China and the Philippines, and somewhat more than two-fifths from other parts of the Indo-Pacific province.

JEFFREYS gives a list of 37 European sea shells found in the Sea of Japan, not only arctic, but peculiar to the temperate zones : J. L. S. xii. pp. 100-109.

TAPPARONE-CANEFRI enumerates shells collected at Woosung, China, and in Japan ; Malac. viagg. Magenta, pp. 154 & 155.

W. H. DALL gives a list of 115 species of true Mollusks from Behring's Strait and the adjacent portions of the Arctic Ocean ; P. Cal. Ac., Feb. 1874, 7 pp.

R. E. C. STEARNS enumerates some sea shells collected at San Juanico and Loreto, Lower California, by W. M. Gabb ; P. Cal. Ac. v. pp. 131 & 132.

9. *Coast of Peru and Chili.*

A number of shells collected on the coasts of Peru and Chili, during the expedition of the Italian frigate Magenta, are enumerated by TAPPARONE-CANEFRI ; l. c. p. 157.

PALÆONTOLOGY OF RECENT SPECIES.

a. *Land and Fresh-water Mollusca.*

Some shells found in Swedish peat-moors and Danish limestone-tufa are enumerated by C. WESTERLUND, Mal. Bl. xxiv. pp. 51-54, including *Helix rudrata* (Stud.), which now prevails in the more northern parts 1874. [VOL. XI.]

of Scandinavia, *Cionella lubrica* (Müll.), as large as now in Lapland, and *Helix nemoralis*, showing that this species is not of late introduction in Scandinavia and Northern Germany. The only species which is not known in the recent fauna is *Helix adela*, sp. n., very near *pulchella* (Müll.), from a submarine peat-moor near Ystad (p. 57).

Two species of *Helix* found in amber, described but not named by KÜNOW, Schr. Ges. Königsb. xiii. (1873) p. 150.

Recent land and sea shells, found in post-pliocene beds at Kiel mingled with decidedly older fossils, are enumerated by VINCENT, P.-v. Mal. Belg. 1874, pp. xiv.-xvii.

A list of land and fresh-water shells found in beds of marly clay at Koeckelberg, valley of the Senne, Belgium, all agreeing with recent species, is given and described by BAUWENS; *tom. cit.* pp. cciii.-ccvi.

The shells found in tufa quarries near the Ammersee, in South Bavaria, which probably formed, after the glacial period, a part of the sea itself, have been examined by S. CLESSIN; the majority of the species are the same as those now living in that lake; but some, as *Paludina vivipara*, now very common, have not yet been found in the tufa, and a few others are somewhat changed, for example, a *Limnæa*, allied to *rosea* (Gallenstein), and *Valvata alpestris* (Blauner) in the tufa, and *V. contorta* (Menke) in the lake. Nachr. mal Ges. 1874, pp. 49-55.

On the shells of peat-moors, by CLESSIN, see above, p. 121.

The form of *Helix hispida*, L., so very common in the alluvial layers called 'Löss' in Southern Germany, is regarded as a distinct species and named *H. terrena*, sp. n., by S. CLESSIN; Nachr. mal. Ges. 1874, pp. 46 & 47.

Shells of the chalk formation in *Galicja* are described, with synonymy, by ST. ZARECZNI, in Sprawozdanie Komisji Fizyograficznej, &c., Krakow, viii. pp. (99)-(183), pls. i. & ii. ST. OLSZEWSKI, *tom. cit.* pp. (212)-(252), describes shells of the miocene.

An important treatise on the fossil land and fresh-water shells of *Dalmatia*, *Croatia*, and *Sclavonia* by SP. BRUSINA may be here mentioned. This was first published in the Croatian language in the Transactions of the South Slavonian Academy of Sciences at Agram, xxviii. (1874), and then also in German as a separate volume of 138 pp., 8vo, with 7 good plates; it contains 139 species, among which 13 are still living in the same countries, 4 in other parts of Southern Europe; the majority of the extinct are clearly allied to recent European, others to Chinese and North American, species. Numerous species of *Paludina*, *Melanopsis*, and *Unio*, most of them with well marked sculpture, are characteristic of the pliocene layers of these countries. The recent species, *Melanopsis esperi*, *prærosa*, and *acicularis*, are found as early as in miocene beds. *Helix pomatia* is said to have been found as a fossil in a pliocene layer, but only one specimen, so that a certain amount of doubt is suggested. *Dreissena polymorpha* (Pall.) is already known to occur in miocene beds.

Subfossil shells in the West Indian Islands of larger size than their living analogues; BLAND, Ann. Lyc. N. York, xi. pp. 77 & 78. *Hyalina nelsoni*, sp. n., subfossil in caverns, Bermuda Islands, l. c. p. 77.

b. Marine Mollusca.

W. KOBELT gives an interesting list of fossil shells collected by himself at Taranto (most of them agreeing with recent species of the Mediterranean; one new, *Bulla amalæ*); JB. mal. Ges. i. pp. 65-77, pl. iii. figs. 1 & 2.

L. BELLARDI'S valuable treatise, "I molluschi dei terreni terziarii del Piemonte e della Liguria," Atti Acc. Tor. (2) xxvii. (1873) pp. 33-294, pls. i.-xv., may be mentioned here. It comprises the Cephalopoda, Pteropoda, Heteropoda, and the families *Muricidæ* and *Tritoniidæ* [*Ranelidæ*] among the Gastropoda, and discusses many species still living in the Mediterranean.

G. F. MATTHEW has published "Notes on the post-pliocene formation in Acadia"; abstracted in P.-v. Mal. Belg. 1874, pp. clvi.-clxiii.

Contemporaneous Changes of Fauna.

Helix lactea (Müll.), naturalized at Buenos Ayres, found on acclimatized plants, and *Limax variegatus* (Drap.), in the same town, in store houses, wells, &c., very probably introduced; STROBEL, Malac. Argent. pp. 13-15 & 8.

Helix virgata (Montagu) from Foul Point, N. W. Australia, possibly introduced; EDGAR SMITH, Moll. Voy. Ereb. & Terr. p. 2, pl. iv. fig. 15.

Tichogonia chemnitzii [*Dreissena polymorpha*] acclimatized in the Upper Danube, near Regensburg; CLESSIN, Nachr. mal. Ges. 1874, p. 87.

Unio tumidus (Retz) found in a channel at Barton; HARDY, Pr. Soc. Manch. xii. p. 117.

Use by Man.

A popular lecture on purple and pearls has been published by E. v. MARTENS in the "Sammlung gemeinverständlicher wissenschaftlicher Vorträge," edited by Virchow & Holtzendorff, series ix. pt. 214. *Murex brandaris*, *trunculus* (L.) and *Purpura hœmastoma* (L.) in the Mediterranean, *P. lapillus* (L.) in the North Sea, and another species of *Purpura* on the west coast of Central America, are the principal species which have yielded purple in former times for the use of man; as to pearls, *Avicula* (*Meleagrina*) *margaritifera* (L.) and several allied species or varieties in tropical seas, *Margaritana margaritifera* (L.) in the streamlets of the northern half of Europe, *Barbala plicata* (Solander) in the streams of Central Asia, and some undetermined species of *Unio* in those of North America, are or were the chief producers. The physiology of both classes and the history of their use are shortly sketched.

FRANCESCHI treats of Egyptian mother-of-pearl, its fishing, and trade, in a work entitled, "Volkswirtschaftliche Studien über Alexandrien" (Wien: 1873), p. 241.

Some notes on the pearl oysters of the Persian Gulf by E. v. MARTENS, Vorder-Asiat. Conchyl. pp. 102 & 103.

R. STEARNS gives an account of the shell money of the aboriginal

tribes of North America, made chiefly from *Venus mercenaria* (L.) on the east coast, and from a species of *Dentalium* [*pretiosum* (Nuttall)] on the west coast, with quotations from earlier writers; he remarks that pieces made from *Olivella biplicata* (Sow.) and *Lucapina crenulata* (Sow.) have also been found in old Indian graves; P. Cal. Ac. v. pp. 113-120, pl. vi.

O. A. MÜRCH has made some notes on the recognition of Linnean species, pointing out that Linné follows Lister in several points; Förh. Skand. naturf. möte 1873, Kjöbenhavn, pp. 415 & 416.

The catalogue of the collection of the late Giov. Rigacci, of Rome, contains 9366 species, with synonyms and localities; the genera are arranged in systematical, the species in alphabetical, order.

Notes on the collection of the Marquis Paulucci, at Novoli, near Florence, are to be found in A. THIELEN'S 'Voyage en Italie' (Tirlemont: 1874).

CEPHALOPODA.

The cartilages, structure of the skin, and vascular system of the Cephalopods, are discussed by Keller; according to him, the chromatophores are cells with a nucleus, their contraction is effected without any muscles or nerves, as in the lymphoid cells, and as in the pigment-cells in the frog and chameleon; glossy particles, or "spangles," contribute to the change in colour. Ber. St. Gall. Ges., 1872-3, p. 447, 1 pl.

The nervous ganglions and their composition in *Sepia officinalis* are minutely described, from examination of transverse sections; L. Stieda, Z. wiss. Zool. xxiv. pp. 84-120, pl. xiii.

The structure of the eye of the Cephalopods is discussed by H. Grenacher, *tom. cit.* p. 574.

M. Ussów has examined the structure of the ovary and development in *Sepia*, *Sepioloa*, *Ommastrephes*, and *Argonauta*; with the result, that from the upper germinal stratum originate the cavity of the inner shell, the epidermis of the whole body and of the gills, the eyes, auditory and olfactory organs, and pericardium, and the cartilages of the head and funnel; the middle germinal layer gives origin on one side to the gills, arms, all muscles, true skin and its chromatophores, peritoneum, branchial hearts, kidneys and all blood-vessels, and central and peripheral nervous system; and on the other side to the veins and arteries, heart, muscular layer of the intestine, and ink-bag. The internal stratum, formed by invagination of the upper, gives origin to the epithelium of the intestine and its appendages (as cœcum, liver, and salivary glands). Arch. f. Nat. xl. pt. 2, pp. 329-372 (and in Russian, Arb. Petersb. Ges. v. pt. 1,

pls. lv.-lx.); a full abstract in JB. Anat. Physiol. (Schwalbe & Hoffmann) iii. pp. 410-413.

On the chromatophores in the embryos of *Loligo vulgaris*; P. Harting, Tijdschr. Ned. Dierk. Ver. i. pp. 209-226, pl. xi.

The development of *Sepiolo* has been described by H. Fol, Arch. Z. expér. iii. pp. xxxiii.-xlv. pl. xviii.: several of his statements confirm those made by E. R. Lankester on *Loligo* [Zool. Rec. x. p. 141], recapitulated P. R. Soc. xxii. p. 232.

Spawn and embryo of *Loligo pealii* (Lesueur); Verrill, Am. Nat. viii. pp. 170 & 171, woodcuts.

The spawn of an undetermined Cephalopod described, and the first stages of its development observed by H. Grenacher; Nachr. Ges. Götting, 1873, pp. 107-115. A similar one by C. Collingwood; J. L. S. xi. (1873) p. 90, pl. i.

Octopus bairdi, sp. n., Verrill, Am. J. Sci. (3) v. (1873) p. 5, footnote, figured in woodcut; Am. Nat. vii. p. 394; and P. Am. Ass. for 1873, pl. i. figs. 1 & 2: New England, 60-106 fathoms.

Sepia. The species of the Mediterranean, commonly called *officinalis*, = *S. filliouxii*, not *officinalis* (L.), which is from the northern seas of Europe. P. Fischer, J. de Conch. xxii. p. 368.

Loligo pallida (Verr.) from New England; Verrill, Am. Nat. viii. pp. 168 & 169, woodcuts.

Ommastrephes pteropus (Steenstrup) found in the Mediterranean; Deshayes, J. de Conch. xxii. pp. 331.

Notes on 5 specimens of gigantic squids found at or near Newfoundland, probably *Architeuthis monachus* and *dux* (Steenstrup); A. E. Verrill, Am. Nat. viii. pp. 167-174, with woodcuts, and Am. J. Sci. (3) vii. pp. 123 & 158-161, 177-184 [ix. 1875, pp. 123-129], also Ann. N. H. (4) xiii. p. 67, with woodcut of an arm, & pp. 255-258. See on the same subject also Murray, P. Bost. Soc. xvi. p. 161; and W. Saville Kent, P. Z. S. 1874, pp. 178-182, where for one of them the name *Megaloteuthis* (g.n.) *harveyi* is proposed, & 489-494, and Pop. Sci. Rev. April, 1874. See also P. Gervais, J. Zool. iv. pp. 88-97.

Hilgendorff's note on a gigantic squid from Japan [Zool. Rec. x. p. 141] is copied in Zool. Gart. xv. p. 157. Former examples are enumerated by Packard, Am. Nat. vii. p. 87, and Dall, *tom. cit.*, p. 484.

Nautilus. Living specimens in shallow waters at the Fiji Islands; Willemöes-Suhm, Z. wiss. Zool. 1874, p. xxxiv.

Munier-Chalmas has observed the apical whorls of the *Ammonites*, and comes to results quite opposed to those of Hyatt [Zool. Rec. ix. p. 126]; he concludes that *Belemnites*, *Ammonites*, *Goniatites*, *Ceratites* and *Clymenia* must be transferred to the order *Dibranchiata* near *Spirula*: C.R. lxxvii. (1873) pp. 1557-1559, also Ann. N. H. (4) xiii. pp. 183-185.

PTEROPODA.

The development of Pteropods, chiefly concerning the first changes within the egg, is described by H. Fol, Arch. Z. expér. iii. pp. xxxiii.-xlv.

pl. xviii.; he observes, that the Pteropods without shell show no remarkable differences in this respect from the Heteropods, or from *Phyllirhoe* and *Actæon*.

Hyalæa tridentata (Lam.); notes by A. Craven, Ann. Mal. Belg. viii. (1873) p. 70, pl. iii.

Creseis conica (Costa) figured by Costa, Ann. Mus. Nap. v. p. 45, pl. i. fig. 2, Naples.

Pelagia alba (Q. G.). A Pteropod possibly identical with it, observed in the Pacific, and shortly described by Willemoës-Suhm; Z. wiss. Zool. 1874, p. xxxv.

Short notes on larvæ of different Pteropods; id. l. c. p. xxxvi.

GASTROPODA.

PECTINIBRANCHIA.

CONIDÆ.

Conus. H. C. Weinkauff has continued the monograph commenced by Küster thirty-three years ago, in his 2nd edition of the conchological work of Martini & Chemnitz, parts 66 & 70, pp. 105-124 (old) 125-300 (new), pls. xix.-liii., with a critical review of the species hitherto described and figured in this work, and bringing their number up to 258. The following are new or not yet figured:—*C. maltzani*[an]us, sp. n., p. 204, pl. xxxii. figs. 3-6, Tahiti; *jickelii*, sp. n., p. 206, pl. xxxii. figs. 11 & 12, Massowah; *lobbeckeanus*, sp. n., p. 221, pl. xxxvi. figs. 3 & 4, locality unknown; *schech* (Jickeli, MS.), sp. n., p. 229, pl. xxxvii. figs. 9 & 10, Red Sea. The synonymy of many known species is corrected.

A systematic catalogue of recent species, with synonyms, quotations, and localities, is given by the same author in JB. mal. Ges. i. pp. 236-268 & 273-288; he enumerates 352 species, arranged in 17 groups, the geographical distribution of which is sketched out, pp. 289-305.

A list of 90 species from New Caledonia, with descriptions and figures of the opercula of many of them, is given by H. Crosse & É. Marie, J. de Conch. xxii. pp. 333-359, pls. xiii. & xiv. The operculum has been found in all species capable of examination, and is of essentially the same structure, but somewhat different in shape (straight or curved) and relative size; in *C. striatus* (L.) and *tulipa* (L.) it is very small. [According to specimens in the Berlin Zoological Museum, a small operculum exists also in *C. geographus* (L.), in which its occurrence was denied by Dr. Gray, Guide Moll. 1857, p. 5.] The living animals of *C. tulipa* and *C. textilis* (L.) sting, producing great pain and swelling.

Conus mazii, Deshayes, J. de Conch. xxii. pp. 62-65, pl. i. fig. 1, Martinique, 50 fathoms; *C. pretiosus*, *masoni*, and *seychellensis*, G. & H. Nevill, J. A. S. B. (n.s.) xliii. pt. 2, p. 22, the two former from the Andaman Islands: spp. nn.

PLEUROTOMIDÆ.

Pleurotoma rougeyroni, *giliberti*, *varicosa*, *scalata*, Souverbie, J. de

Conch. xxii. pp. 187-192, pl. vii. figs. 1-4, and *P. moquiniana*, Montrouzier, tom. cit. p. 193, pl. vii. fig. 5, spp. nn., New Caledonia.

Pleurotoma kaderleyi and *luehdorfi* (Lischke, 1872), from Yeddo, Japan, fully described; Lischke, Jap. Meeres Conch. iii. pp. 22 & 23, pl. i. figs. 1, 2-4.

Drillia viduatooides, *papillosa*, *minutissima*, and *pusilla*, spp. nn., Garrett, P. Ac. Philad. 1873, p. 217, pl. ii. figs. 28-31, Viti Islands.

[*Bela*] *Pleurotoma pyramidalis* (Ström) from East Greenland, teeth and operculum described and figured by K. Möbius, Zweite Deutsche Nordpol-fahrt, ii. pt. 1, p. 249, pl. i. figs. 1-3.

[*Bela* ?] *Pleurotoma vinosa*, sp. n., Dall, P. Cal. Ac. Feb. 1874, Great Kyska Island, Aleutian Group.

Many contributions to the synonymy of European *Pleurotomidæ* are to be found in the paper of the Marquis de Monterosato, J. de Conch. xxii. pp. 277-279, 360 & 364. Some of the most important are:—*Pleurotoma anceps* (Eichwald, 1830, foss.) = *teres* (Forbes, 1843) = *boreale* (Lovén, 1846). *P. stria* (Calcare, 1839) = *semiplicatum* (Philippi, 1844, foss.) recent, but very rare, in the Mediterranean. *P. loprestiana* (Calcare, 1841) = *turentini* (Philippi, 1844) = *tricinctum* (Brugnone, 1860). *P. maravignæ* (Bivona, 1838) = *elegans* (Scacchi, 1836, nec DeFrance, 1826) = *incisa* (Reeve, 1843) = ? *costulatum* (Cantraine, 1835). *P. clathrata* (Marcel de Serres, 1829) = *rude* (Phil., 1836) = *delosensis* (Reeve, 1845).

Raphitma (Mangelia) bertrandi (Payr.) = *cærulans* (Phil.), *sicula* (Reeve) = *P. plicatum* (Phil.) = *R. philippii* (Weinkauff), *sandriana* (Brusina) = *cærulans* (Weink.), *multilineolata* (Desh.) = *coarctata* (Weink.) = *pusilla* (Scacchi), and *rugulosa* (Philippi) = *albida* (Desh.?), all from the Mediterranean, described and figured by Weinkauff, JB. mal. Ges. i. pp. 208-221, pl. x. figs. 1-10.

Defrancia albigirata, sp. n., Baird, in Brencley's 'Cruise of the Curaçao,' p. 434, pl. xxxvi. figs. 3 & 4, New Caledonia.

Clathurella pulchella, *dædalea*, *cælata*, *infrasulcata*, *obesa*, *semilineata*, *pinguis*, and *punctifera*, Garrett, P. Ac. Philad. 1873, p. 219, pl. iii. figs. 32-39, Viti Islands; *C. jewetti*, Stearns, tom. cit. p. 346, West Coast of Florida: spp. nn.

Cithara amabilis, G. & H. Nevill, J. A. S. B. (n.s.) xliii. pt. 2, p. 23, pl. i. fig. 11, Mauritius; *C. melanostoma* and *abbreviata*, Garrett, l. c. p. 222, pl. iii. figs. 40 & 41, Polynesia: spp. nn.

Daphnella fusiformis, *millegrana*, *vitrea*, and *tessellata*, Garrett, l. c. p. 229, pl. iii. figs. 58-61, Paumotu Islands.

Mangelia rugulosa (Phil.) found at Arcachon; on its difference from *costata* (Donovan) and *vauquelini* (Payr.), P. Fischer, Act. Soc. L. Bord. xxix. p. 209.

Pleurotomella, g. n.; no eyes, no operculum, sinus wide and very deep, apex nearly smooth. *P. packardi*, sp. n., Verrill, Am. J. Sci. (3) v. (1873) p. 15, footnote, St. George's Bank, New England, 150 fathoms.

Lachesis vulpecula (Monterosato), Monterosato, J. de Conch. xxii. p. 276, Mediterranean.

Taranis mærcchi (Malm, 1863, Jeffr.) = *Pleurotoma cirratum* (Brug-

none, 1862, *nec* Bellardi, 1847) = *Bela demersa* (Tiberi, 1868), recent, in the Mediterranean; full-grown specimens have a slight trace of notch at the peristome, which justifies its place in the genus *Pleurotoma*. Monterosato, J. de Conch. xxii. pp. 278 & 360.

TEREBRIDÆ.

Terebra strigilata (L.) from Nagasaki; on its synonymy, Lischke, Jap. Meer. Conch. iii. p. 40.

Terebra (*Liostoma*) *parva*, sp. n., Baird, in Brenchley's Cruise of the Curaçao, p. 435, pl. xxxvii. figs. 4 & 5, New Caledonia.

CANCELLARIIDÆ.

Cancellaria bocageana (Crosse) var. from Yeddo; Lischke. Jap. Meer. Conch. iii. p. 41, pl. ii. figs. 12-14. On synonymy of *C. scalarina* (Lam.), *id. l. c.* pp. 41 & 42.

MURICIDÆ (& PURPURIDÆ).

Murex lienardi (Crosse), Crosse, J. de Conch. xxii. p. 74, pl. iii. fig. 4, Mauritius.

Murex crossei, Liénard, *tom. cit.* p. 70, pl. i. fig. 2, Mauritius; *M. senilis* and *flavidus*, Jousseau, R. Z. (3) ii. pp. 5 & 8, pl. i. figs. 5, 6, & 7, 8, the former from the Philippines, the locality of the latter unknown: spp. nn.

Typhis (Montf.). Sowerby gives a monograph of this genus in Reeve's 'Conchologia Iconica,' pts. 310 & 311, with 3 plates and 15 species; no new species are described, but *T. fimbriatus* (Ad. & Reeve) fig. 3 [= *jamrachi*, Martens, 1860], has not before been figured.

Purpura (*Ricinula*) *siderea* (Reeve) from the Persian Gulf; Martens, Vorderasiat. Conch. p. 95, pl. v. fig. 49.

Rapana fritschi, sp. n., *id.* JB. mal. Ges. i. p. 135, pl. vi. fig. 3, False Bay, South Africa.

Coralliophila meyendorffi (Calcare) from Naples and Sicily, in the littoral zone, described by Kobelt, JB. mal. Ges. i. p. 222, pl. xi. fig. 1.

Latiaxis tectum-sinense (Desh.) = *benoitii* (Tiberi) = *Fusus babelis* (Requien, 1848); *id. l. c.* p. 225.

Leptoconchus robillardii (Liénard) = *Coralliobia fimbriata* (A. Ad.); Nevill, J. A. S. B. (n.s.) xliii. pt. 2, p. 29.

Leptoconchus sp., probably *rostratus* (A. Ad.), from Yeddo; Lischke, Jap. Meer. Conch. iii. p. 33.

Macron, H. & A. Ad., sub-g. of *Pseudoliva*. The 3 known species, *æthiops* (Rve.), *kellei* (A. Ad.), and *lividus* (A. Ad.) characterized, all from the west coast of North America; Stearns, P. Cal. Ac. v. p. 132, footnote. [Two others have been described, *M. commoda*, locality unknown, by A. Adams, P. Z. S. 1863, p. 430, and *wrightii*, Patagonia, by H. Adams, P. Z. S. 1865, p. 753.]

BUCCINIDÆ.

Neptunea despecta (L.), from Yeddo, with critical remarks; Lischke, Jap. Meer. Conch. iii. pp. 24 & 25.

Neptunea curta (Jeffr.) = *islandica* (Gould, nec Lovén), its dentition agreeing with that of genuine *Neptunea*, from New England; Verrill, Am. J. Sci. (3) vi. p. 439, footnote.

Neptunella (Verrill, in Report of U. S. Fish. Commission for 1871), "new genus or subgenus" for *Fusus pygmaeus* (Gould), from its dentition differing considerably from the typical forms of *Neptunea*, and its woolly epidermis; Verrill, loc. cit. p. 439, footnote.

Volutopsis attenuata, sp. n., Dall, P. Cal. Ac. Feb. 1874, Behring's Strait.

Tritonofusus mæbii, sp. n., Dunker & Metzger, Nachr. mal. Ges. 1874, p. 8, and JB. mal. Ges. i. p. 148, pl. vii. fig. 1, S. Norway, 106 fathoms [= *Trophon sarsi*, S. Wood, sec. Jeffreys]. *Fusus propinquus* (Alder) = *Tritonium islandicum*, var. *sulcatum* (Middendorff), from E. Greenland; Möbius, Zweite deutsche Nordpol.-fahrt ii. pt. i. p. 249. [For true *Fusus*, = *Colus* (Gray), see FASCIOLARIIDÆ, *infra*.]

Euthria lacertina (Gould) figured; Martens, JB. mal. Ges. i. p. 133, pl. vi. fig. 2, South Africa.

Buccinum undatum (L.), var. from E. Greenland; Möbius, l. c. p. 249. A living specimen [? = *B. fusiforme*] found in the Mediterranean at Cannes; Macé, J. de Conch. xxii. p. 331.

Buccinum fusiforme (Kien.). Specimens from the Mediterranean Sea described by Kobelt, JB. mal. Ges. i. pp. 230-235, pl. xi. fig. 5; = *B. humphreysianum* (Bennett), var., Jeffreys, tom. cit. pp. 346 & 347.

Buccinum leucostoma (Lischke, 1872) from Yeddo, allied to *B. terranova* (Mörch), = *donovani* (Reeve, nec Gray); Lischke, Jap. Meer. Conch. iii. p. 38, pl. i. figs. 7 & 8.

Buccinopsis canaliculata, sp. n., Dall, P. Cal. Ac. v. pt. 2, Feb. 1874, Cape Espenberg, Behring's Strait.

NASSIDÆ.

Nassa dominula, sp. n., Tapparone-Canefri, Malac. viagg. Magenta, p. 19, pl. i. fig. 17, Yokohama, Japan.

Nassa japonica (A. Ad., 1851, nec Reeve, nec Lischke, 1870) fully described; Lischke, Jap. Meer. Conch. iii. p. 37, pl. xx. figs. 20-22.

Nassa anthracina, sp. n., Garrett, P. Ac. Philad. 1873, p. 229, pl. iii. fig. 57, Viti Islands.

Nassa bifaria, sp. n., Baird, in Brenchley's Cruise of the Curaçao, p. 436, pl. xxxviii. figs. 1 & 2, New Caledonia.

Nassa persica, sp. n., perhaps = *deshayesiana* (Issel, nec *deshayesi*, Hombron & Jacquinot); Martens, Vorderasiat. Conch. p. 94, pl. v. fig. 47.

Nassa elongata, China Sea, *lirata*, Philippines, *lucida*, Keeling Island, spp. nn., *concentrica*, new name for *concinna* (Reeve, nec Powis); Marratt,

Ann. N. H. (4) xiii. pp. 70 & 71, with some rectifications of synonymy in the same genus.

Nassa (*Arcularia*) *callispira*, Ad., juv. ?, or sp. n. ?, Andamans, (*Hima*) *sistroidea*, sp. n., Andamans, (*Niotha*) *sinusigera*, A. Ad., var. *cernica*, Mauritius, and (*Telasco*) *stoliczkana*, sp. n., Calicut, Nevill, J. A. S. B. (n. s.) xliii. pt. 2, pp. 24 & 25, pl. i. figs. 5-8.

Bullia diluta, var. n. *mediolævis*, Martens, JB. mal. Ges. i. p. 137, pl. vi. fig. 4, False Bay, South Africa.

Eburna valentiana = *canaliculata* (Schumacher), var., and intermediate forms from the Persian Gulf are described; *id.* Vorderasiat. Conch. pp. 92 & 93, pl. v. figs. 44-46.

OLIVIDÆ.

Oliva signata (Lischke, 1873) fully described; Lischke, Jap. Meer. Conch. iii. p. 44, pl. ii. figs. 26 & 27, Yeddo.

Ancillaria albicallosa (Lischke, 1873) fully described; *id.* *ibid.* figs. 24 & 25, Nagasaki.

TURBINELLIDÆ.

Turbinella. Kobelt has continued the monograph of this genus (as originally defined, including many *Fascioliidæ*), commenced by Küster (1844), in his continuation of the conchological work of Martini & Chemnitz. The part now issued contains descriptions and coloured figures of 60 species, partly by Küster, partly by Kobelt (some rather bad); among them are:—*T. wagneri* (Anton), p. 16, pl. v. figs. 8 & 9; *clavata* (Wagner), p. 25, pl. v. fig. 1; *elegans* (Dunker, MS.), p. 33, pl. vii. fig. 4; *iostoma* (Nuttall), p. 36, pl. ix. figs. 1 & 2; *triserialis* (Lam.) var., p. 46, pl. ix. A, figs. 3 & 4, from the Cape Verde Islands; *stigmataria* (A. Adams), p. 49, pl. ix. A, figs. 11 & 12, Sandwich Islands.

FASCIOLARIIDÆ.

Fusus inconstans (Lischke). The radula, examined by G. Schacko, agrees well with that of the *Fascioliidæ*, so that very probably the genus *Fusus* in its restricted sense (= *Colus*, Gray) must be removed to this family from the *Muricidæ*. JB. mal. Ges. i. pp. 115-119, pl. vi. fig. 1.

Fusus (*Colus*) *similis*, New Caledonia, and *brenchleyi*, South Sea, spp. nn., Baird, in Brenchley's Cruise of the Curaçao, pp. 432 & 434, the latter figured, pl. xxxvii. figs. 1 & 2.

Fasciolaria aurantiaca (Lam.) from Rio Janeiro; Kobelt, Nachr. mal. Ges. 1874, p. 59.

Latirus albus, sp. n., Jeffreys, in Wyville-Thomson's Depths of the Sea (1873), p. 474, woodcut.

Lathyrus [sic] *albellus*, sp. n., Dunker & Metzger, Nachr. mal. Ges. 1874, p. 8, and JB. mal. Ges. i. p. 150, pl. vii. fig. 4, Southern Norway, 106-120 fathoms; a new generic name, *Meyeria*, proposed for it, but not charac-

terized, *ibid.* [= *Tritonium pusillum*, Sars, and *L. albus*, Jeffr., *teste* Jeffreys].

Tudicla spirilla (L.). Operculum figured, and its systematic place in the *Fascioliariidæ* defended by H. Adams, P. Z. S. 1874, p. 582, pl. lxi. fig. 2.

MITRIDÆ.

Mitra. C. F. Jickeli gives a critical enumeration of 16 species of *Mitra* proper, 5 of *Strigatella*, 25 of *Turricula*, and 2 of *Cylindra*, in all 48 species occurring in the Red Sea, mostly collected by himself, with careful synonymy; JB. mal. Ges. i. pp. 17-54. The following are new:—*M. hemprichi*, p. 21, pl. ii. fig. 1; *M. (Scabricula) ehrenbergi*, p. 24, fig. 3; *M. (Cancilla) tathnæ*, p. 25, fig. 4; *Turricula (Costellaria) semitica*, p. 45, fig. 8; and *T. æthiopica*, p. 47, fig. 9. *T. pharaonis*, H. Adams, *nec* Génè, is re-named *appellii*, p. 39, pl. ii. fig. 5. *T. osiridis* (Issel) found in a recent state, p. 40, pl. ii. fig. 6. *T. judæorum* (Dohrn) figured for the first time, pl. ii. fig. 7.

Mitra zonata (Marryat) from Sicily, described and figured by Kobelt, JB. mal. Ges. i. p. 227-230, pl. xi. figs. 3 & 4; found also on the coast of Algeria, Velain, J. de Conch. xxii. p. 331.

Mitra jucunda, sp. n., Tapparone-Canefri, Malac. viagg. Magenta, p. 27, pl. i. fig. 3, Mauritius.

Mitra (Turricula) garretti, new name for *assimilis* (Garrett, 1872, *nec* Pease, 1867), Nevill, J. A. S. B. (n.s.) xliii. pt. 2, p. 29.

Mitra (Pusia) cernica, sp. n., *id. l. c.* p. 24, pl. i. fig. 9, Mauritius.

COLUMBELLIDÆ.

Columbella compta (Lischke, 1873) fully described; Lischke, Jap. Meer. Conch. iii. p. 34, pl. ii. figs. 8 & 9.

Columbella undata (Duclos) and *misera* (Sow.), varieties from Japan; *id. tom. cit.* p. 35, pl. ii. figs. 1-4, & 10, 11.

Columbella avara (Say) from Rio Janeiro; Kobelt, Nachr. mal. Ges. 1874, p. 59.

Columbella (Anachis) sinuata, H. Adams, P. Z. S. 1874, p. 600, pl. lxii. fig. 2, Upper California; *C. (A.) digglesi*, *gowlandi*, and (*Mitrella*) *rusSELLi*, Brazier, *tom. cit.* p. 671, pl. lxxii. figs. 11, 12, 15, 16, & 17, 18; island on the N.E. Coast of Australia.

Anachis semiplicata and *acuta*, spp. nn., Stearns, P. Ac. Philad. 1873, p. 344, west Coast of Florida.

Nitidella filosa, sp. n., *id. tom. cit.* p. 345, west Coast of Florida.

MARGINELLIDÆ.

Marginella picturata and *inconspicua*, Mauritius, and *deformis*, Ceylon, spp. nn., G. & H. Nevill, J. A. S. B. (n.s.) xliii. pt. 2, p. 23.

Volvarina (Volvarina) pygmæa, sp. n., Garrett, P. Ac. Philad. 1873, p. 217, pl. ii. fig. 22, Viti Islands.

CASSIDIDÆ AND RANELLIDÆ.

Tritonium seguenzæ (Aradas & Benoit) very rare on the eastern coast of Sicily, is scarcely distinct from the West Indian form of *T. variegatum* (Lam.); Kobelt, JB. mal. Ges. i. pp. 347-352, pl. xiv. Lischke, Jap. Meer. Conch. iii. pp. 28 & 29, comes to the same conclusion.

Tritonium parthenopeum (Salis) from Rio Janeiro; Kobelt, Nachr. mal. Ges. 1874, p. 58.

Triton tenuiliratus (Lischke, 1873) from Southern Japan, fully described; Lischke, Jap. Meer. Conch. iii. p. 30, pl. ii. figs. 18 & 19.

Triton (Epidromus) comptus, sp. n., Sowerby, P. Z. S. 1874, p. 598, pl. lxxii. fig. 5, Hongkong.

Triton (Gutturium) orientalis, Nevill, J. A. S. B. (n.s.) xliii, pt. 2, p. 29, Andamans.

Triton cancellatus (Lam.). Its distinctness from *oregonensis* (Redf.), and its occurrence in the Straits of Magellan, defended by Lischke, Jap. Meer. Conch. iii. pp. 31 & 32.

Dolium galea (L.), var., from Rio Janeiro; Kobelt, Nachr. mal. Ges. 1874, p. 57.

CERITHIOPSIDÆ.

Cerithiopsis tubercularis (Montagu), varr. 1, *pygmæa* (Phil.), 2, *acicula*, (Brusina), 3, *minima* (Brusina); *C. bilineata* (Hörnes) = *coppoleæ* (Aradas); *C. horrida* (Jeffreys, MS.), *diadema* and *tiara* (Watson, MS.), spp. nn., characterized by Monterosato, J. de Conch. xxii. pp. 272-274, Mediterranean.

CYPRÆIDÆ.

Cypræa tricornis and *lienardi*, spp. nn., Jousseaume, R. Z. (3) ii. pp. 9 & 11, pl. i. figs. 3, 4, & 1, 2, both from Mauritius, the latter also from New Caledonia, and very near *cicercula*.

Cypræa macula (A. Ad.) = *fimbriata* (Gmelin), var.; Lischke, Jap. Meer. Conch. iii. p. 47.

Cypræa vitellus, juv.; Tapparone-Canefri, Malac. viagg. Magenta, p. 30, pl. i. fig. 1.

Cypræa physis (Brocchi) found at the Balearic Islands, and *C. candidula* (Gaskoin) on the Atlantic and Mediterranean Coast of Spain; Hidalgo, Moll. mar. Esp. pt. 9.

NATICIDÆ.

Natica limacina, West Indies?, *manceli*, Mauritius, *marchei*, Moluccas, *cernica*, Mauritius, Bourbon, and Madagascar, *bayani*, *lineozona*, and *insecta*, from unknown localities, Jousseaume, R. Z. (3) ii. pp. 14-24, pl. ii. figs. 1-14; *N. gaidei*, Souverbie, J. de Conch. xxii. p. 196, pl. vii. fig. 7, New Caledonia: spp. nn.

Neverita larvata, sp. n., Tapparone-Canefri, l. c. p. 34, pl. i. fig. 5, locality unknown.

Naticina papilla (Chem.), operculum horny; Souverbie & Montrouzier, J. de Conch. xxii. p. 198, pl. vii. fig. 8.

Sigaretus undulatus and *japonicus* (Lischke, 1872) from Yeddo, fully described; Lischke, Jap. Meer. Conch. iii. pp. 54 & 55, pl. iii. figs. 11-14, & 15-17.

SOLARIIDÆ.

The following species of *Solarium* live in the Mediterranean:—*S. pseudoperspectivum* (Brocchi) = *perspectiviforme* (Tib.) juv., = *discus* (Phil.); *S. mediterraneum* (Monter.) = *pseudoperspectivum*, Desh. & Wienk., = *pulchellum* (Tib., nec Mich.); *S. siculum* (Cantr.) = *stramineum* (Phil., nec Lam.) = *fallaciosum* (Tib.); *S. conulus* (Weink.) = *luteum* (Phil., pt., nec Lam.); *S. archytæ* (Costa) = *sowerbii* (Hanl.); *S. moniliferum* (Brown). Kobelt, JB. mal. Ges. i. pp. 107-115, the first and second figured, pl. iii. figs. 4 & 5. Additional notes, pp. 344-347. *S. discus* (Phil.): its soft parts and operculum described by Monterosato, J. de Conch. xxii. p. 269. *S. fallaciosum* (Tib.) = *brocchii* (Cant.); *id. tom. cit.* p. 360.

PYRAMIDELLIDÆ.

Obeliscus tenuisculptus (Lischke, 1872) fully described; Lischke, Jap. Meer. Conch. iii. p. 58, pl. iii. figs. 7 & 8, Yeddo.

Obeliscus hyalinus, sp. n., Garrett, P. Ac. Philad. 1873, p. 228, pl. iii. fig. 56, Paumotu and Society Islands.

Monotypgma eximium (Lischke, 1872) fully described; Lischke, *l. c.* p. 59, pl. iii. figs. 4-6.

Odostomia pistillus, sp. n., Brugnone, Miscell. malacol. 1873, p. 9, fig. 13; re-named *brugnonii* by Monterosato, J. de Conch. xxii. p. 266.

Odostomia flexuosa (Jeffreys, MS.), sp. n., *nitidissima* (Montagu), and *bulimulus* (Brugnone), new name for *bulimoides* (Brugnone, nec Souverbie, 1865), shortly characterized by Monterosato, J. de Conch. xxii. pp. 267 & 268, Mediterranean.

Odostomia densecostata, *exilis*, *densestriata*, *oryza*, *sulcata*, *amanda*, *pulchra*, *crystallina*, *lutea*, *obeliscus*, *vitrea*, *unilineata*, and *cuspidata*, spp. nn.; Garrett, P. Ac. Philad. 1873, p. 223, pl. iii. figs. 42-54, Viti Islands.

Eulimella folini, sp. n., Fischer, in Berchon's Fonds de la mer, i. p. 149, pl. xxii. fig. 8, dredged at the mouth of the Gironde, probably exotic.

Achis angulata, sp. n., *id. l. c.* p. 150, pl. xxiii. fig. 1, dredged at the mouth of the Gironde, probably exotic.

Cioniscus gracilis (Jeffreys, MS.), sp. n., Monterosato, J. de Conch. xxii. p. 264, Mediterranean.

Mathilda quadricarinata (Brocchi, sp.) = *Eglisia macandree* (H. Ad.), described from full-grown specimens; operculum horny, concentric. Kobelt, JB. mal. Ges. i. p. 226, pl. xi. fig. 2, and Monterosato, J. de Conch. xxii. p. 265.

Apicalia holdsworthi, sp. n., H. Adams, P. Z. S. 1874, p. 585, pl. lxix. fig. 1, Ceylon.

EULIMIDÆ.

Eulima curva (Jeffer.), sp. n., Monterosato, J. de Conch. xxii. p. 269, Mediterranean.

Arcuella, subg. n. of *Eulima*; distinct by its regular spiral striation and by the columella being twisted back, so as to form an acute angle at the base of the aperture. *Eulima* (A.) *mirifica*, sp. n., G. & H. Nevill, J. A. S. B. (n.s.) xliii. pt. 2, p. 26, pl. i. fig. 10, Ceylon.

STILIFERIDÆ.

Stylifer dubius, sp. n., Baird, in Brenchley's Cruise of the Curaçao, p. 437, pl. xxxviii. figs. 5 & 6, New Caledonia.

STROMBIDÆ.

Strombus pacificus (Swains.), var., and *S. latissimus* (L.) from Japan; Lischke, Jap. Meer. Conch. iii. pp. 19 & 20.

Strombus robustus, sp. n., near *succinctus* (L.), Sowerby, P. Z. S. 1874, p. 599, pl. lxxii. fig. 3, Hongkong.

OVULIDÆ.

Ovulum sinense, sp. n., *id. tom. cit.* p. 599, pl. lxxii. fig. 1, Hongkong.

TRICHOTROPIDÆ.

Trichotropis. Monographed by Sowerby in Reéve's Conchologia Iconica, pts. 316 & 317, containing 13 species (none new) on 2 plates.

Trichotropis clathrata (A. Ad.) from New Zealand; Edgar Smith, Moll. Voy. Ereb. & Terr. p. 3, pl. i. fig. 21.

Læochochlis [!] *pommeraniæ* [!], g. & sp. nn., W. Dunker & A. Metzger, Nachr. mal. Ges. 1874, p. 7, and JB. mal. Ges. i. pp. 146-148, pl. vii. fig. 3, from the coast of S. Norway, 106 fathoms, a sinistral shell of turrit shape, resembling *Turritella* or *Cerithium*, radula with falciform lateral teeth. [Belongs very probably to *Trichotropis*, Martens, JB. mal. Ges. ii. 1875, p. 116; = *Triforis macandrea*, H. Ad., and *Cerithium granosum*, S. Wood, *sec. Jeffreys*.]

Torellia vestita (Jeffer.) ?, dredged near St. George's Bank, New England, and described by Verrill, Am. J. Sci. (3) v. (1873) p. 15, note.

CERITHIIDÆ.

Cerithium conicum (Blainv.) = *mammillatum* (Risso ?, Philippi) has been found by Prof. Zittel in the Libyan desert, in saline ditches near Siwa; its proper home is in the lagoons and marshes of brackish water on the coasts of the Mediterranean; its operculum is multispiral as in other *Potamides*; Martens, SB. nat. Fr. 1874, pp. 112-114.

Cerithiolum pusillum (Jeffreys, as *Turritella* ?, 1856) ? = *schwartzi* (Hörnes, foss.) and *lacteam* (Phil.) ; notes by Monterosato, J. de Conch. xxii. p. 271.

Cerithidea rhizosperarum[-*phorarum*] (Ad.) ; Tapparone-Canefri, Malac. viagg. Magenta, pp. 38 & 39, pl. i. fig. 14. *C. quadrata* (Sow.) described, *id.* l. c. p. 40.

Cerithidea bicarinata (Gray) ; Edgar Smith, Moll. Voy. Ereb. & Terr. pl. i. fig. 20, type.

Telescopium fuscum (Schumacher), on its variability : Tapparone-Canefri, l. c. p. 42.

Læochochlis [see TRICHOTROPIDÆ].

MELANIIDÆ.

Melania tuberculata (Müll.) = *fasciolata* (Oliv.) = *virgulata* (Fér.) = *punctulata* (Grateloup) = *aspersa* (Trosch.) = *tamsii* and *flammigera* (Dunk.) = *rivularis* (Phil.) = *unifasciata* (Mouss.) = *indefinita* and *canalis* (Lea) = *zengana* and *commersoni* (Morel.) = *tigrina* (Hutton) = *pyramis* (Bens.) = *exusta* and *wallacii* (Reeve) = *dembeana* (Rüpp.) = *beryllina* (Brot) = *layardi* (Dohrn) = *rubripunctata* (Tristram) ; widely distributed through Northern, Western, and Eastern Africa and India, and very variable in size, form, and sculpture. Jickeli, Verh. L. C. Ak. xxxvii. pp. 251-258, pl. vii. fig. 36 : jaw and radula, pp. 253 & 254, pl. iii. fig. 7.

Melania doriæ, Singapore, *brotiana*, sp. n., East Indies, and *præmordica* ? (Tryon) juv. ; Tapparone-Canefri, Malac. viagg. Magenta, pp. 45 & 46, pl. i. figs. 4, 2, & 7.

Melania iravadica (Blanf.), *confusa* (Dohrn), *batana* (Gould), and *baccata* (Gould) figured ; Hanley & Theobald, Conch. Ind. pls. lxxi. fig. 1, lxxii. fig. 4, lxxiv. figs. 8 & 9, & lxxv. figs. 1-4, with corrections of synonymy in other species.

Melania australis (Reeve), E. Smith, Moll. Voy. Ereb. & Terr. pl. iv. fig. 3.

Melania brenchleyi, Baird, in Brenchley's Cruise of the Curaçao, p. 440, pl. xl. Savage Island, Polynesia.

Melanopsis costata (Oliv.) var. *turcica* (Parr.) from Antioch, Mousson, J. de Conch. xxii. pp. 33 & 48 ; varr. nn. *infracincta* and *minor*, Mesopotamia, Martens, Vorderas. Conch. pp. 32 & 33, pl. v. figs. 38-40 ; *nodosa* (Fér.), var. n. *moderata*, Lower Mesopotamia, Mousson, l. c. p. 48 ; *prærosa* (L.), varr. from Syria and Mesopotamia, Martens, l. c. p. 32.

Melanopsis fasciata, *fragilis*, *aurantiaca*, *elongata*, and *brotiana*, spp. nn., Gassies, J. de Conch. xxii. pp. 381-387, New Caledonia. *M. trifasciata* (Gray) ; E. Smith, Moll. Voy. Ereb. & Terr. pl. i. fig. 22, New Zealand.

Schizostoma lewisi (Lea, P. Ac. Philad. 1869) ; Lea, J. Ac. Philad. (2) viii. p. 61, pl. xxi. fig. 16 (= Observ. Union. xiii. pl. xxi. fig. 16), Alabama.

Goniobasis lawrencii, Arkansas, and *baculoides*, Alabama (Lea, l. c.

1869); *id. tom. cit.* p. 62, pl. xxi. figs. 17 & 18 (= *Observ. Union.* xiii. pl. xxi. figs. 17 & 18).

Paludomus luteus, sp. n., H. Adams, P. Z. S. 1874, p. 585, pl. lxxix. fig. 5, Borneo.

LITORINIDÆ.

Litorina tristis, sp. n., Mousson, J.B. mal. Ges. i. p. 101, pl. v. fig. 5, mouth of river Rabat, Morocco.

Fossarus caledonicus, sp. n., Crosse, J. de Conch, xxii. p. 206, New Caledonia.

RISSOIDÆ.

Rissoina minuta, Andamans, *evanida*, Andamans, and *pererassa*, Mauritius, G. & H. Nevill, J. A. S. B. (n. s.) xliii. pt. 2, p. 25, pl. i. figs. 13-15; *R. supracostata*, *sculptilis*, *millecostata*, *oryza*, *horrida*, *scabra*, *castaneogramma* [1], *gracilis*, *debilis*, *affinis*, *terebra*, and *turrita*, Garrett, P. Ac. Philad. 1873, p. 209, pl. ii. figs. 1-12, Polynesia: spp. nn.

Rissoa ambigua, Brugnone, *Miscell. Malac.* 1873, p. 9, fig. 14 (= *alleraryana*, Benoit, 1872, not described, Aradas & Benoit, *Conch. viv. mar. Sicil.* ii. p. 211, pl. iv. fig. 11; ? = *tincta*, Watson, 1873, *Monterosato*, J. de Conch. xxii. p. 262, Mediterranean); *R. gemmula*, Fischer, in Berchon, Folin and Périer's *Fonds de la mer*, i. p. 151, pl. xxiii. fig. 3, Gulf of Gascony, 60 fathoms; *R. vitrea*, *littoriniformis*, *infrastricta*, *infratincta*, *venusta* [pre-occupied], *crystallina*, *hyalina*, and *truncata*, Garrett, P. Ac. Philad. 1873, p. 215, pl. ii. figs. 19-26, Polynesia: spp. nn.

Plagiostyla, g. n., for *Rissoa lactea* (Mich.), and some allied species, remarkable by the papillary apex, transparent shell, descending last whorl, distinctly semilunar aperture, and oblique rectilinear pillar-lip. *P. asturiana*, sp. n., P. Fischer, *Fonds de la mer*, ii. p. 50, pl. ii. fig. 5, and *Act. Soc. L. Bord.* xxix. p. 203, Asturia and Bay of Biscay, 10-18 fathoms.

Rissoopsis, g. n.; shell cylindrical, thin, apex truncate, aperture sub-oval, entire, angulated above, peristome rather thin, somewhat expanded, pillar oblique, arcuate. *R. typica*, sp. n., Garrett, P. Ac. Philad. 1873, p. 228, pl. iii. fig. 55, Viti and Samoa islands.

Peringia, g. n., proposed by A. Paladilhe for *Hydrobia ulvæ* (Penn.), and allied species, living in brackish water, and characterized by a bilobate snout, a black spot near the tip of the tentacles, somewhat flattened sub-carinate whorls, and a thin callosity on the inner side of the aperture. He describes the following species:—*P. pictonum*, sp. n., pl. iii. figs. 29 & 30, brackish water at Rochelle and Sables d'Olonne; *girardoti*, sp. n., pl. iii. figs. 31 & 32, salt marshes at Pouliguen, near Nantes; *ulvæ* (Penn.), described from English specimens; (*Assimineæ*, Paladilhe, 1867), *gallica*, alluvial deposits of the Bétru, near St. Amour, Jura, near a saline spring; *sequanica* (Bourguignat, MS.), sp. n., mouths of the Seine and Orne; *massoti* and *penchinati* (Bourguignat, MS.), spp. nn., Salces, Eastern Pyrenees; *margaritæ*, new name for *Paludestrina tetropsoides* (Paladilhe, 1870), pl. iii. figs. 33 & 34, living in a small pond

in the Isle of St. Marguérite, Var; *subumbilicata* (Montagu) described from specimens found at Boulogne, and proposed to be called *baudoni*, if they prove not to be Montagu's species. Ann. Sci. Nat. (6) i. pp. 1-28.

Paludestrina subulata and *subobesa*, spp. nn., Marion, Ann. Sci. Nat. (6) i. pp. 37 & 38, pl. iii. figs. 23, 24, and 25, 26, Morbihan, brackish water. *P. brevispina*, sp. n.?, figured but not described, figs. 27 & 28.

Hydrobia sudetica, Reinhardt, Arch. f. Nat. xl. pp. 25 & 74, Sudetic Mountains; *H. procera*, Marion, l. c. p. 35, pl. iii. figs. 21 & 22, streamlet of Sillé, near Luçon, La Vendée: spp. nn.

Hydrobia gaillardoti (Bourg.), Aleppo; Martens, Vorderasiat. Conch. p. 31, pl. v. fig. 37.

Hydrobia vitrea (Drap.), living in a cave; shell and animal described by Fries, JH. Ver. Württ. xl. pp. 122-138.

Hydrobia ammonis (Martens), Siwa Oasis, *H. erythræa* (Martens), Coast of Red Sea, and *H. schweinfurthi* (Jickeli, 1873), White Nile; Jickeli, Verh. L. C. Ak. xxxvii. pp. 248-250, pl. vii. figs. 33, 34, & 35.

Hydrobia gentilsiana, Crosse, J. de Conch. xxii. pp. 112 & 395, pl. xii. fig. 9, and *H. crosseana*, Gassies, tom. cit. p. 215, New Caledonia: spp. nn.

Hydrobia antipodum and *zelandiæ* (Gray); E. Smith, Moll. Voy. Ereb. & Terr. pl. vii. fig. 19, two figures.

Hydrobia lapidum (Orb.), var. n. *dunkeri*, *H. kuesteri*, sp. n., and var. *cordilleræ*, *piscium* (Orb.), *parchappii* (Orb.), and *australis* (Orb.); Strobel, Malac. Argent. pp. 59-66, Argentine Republic.

Hydrobia (Amnicola) brevicula and *pallida*, spp. nn., Martens, in Fedchenko's Turkestan Voyage, Moll. pp. 30 & 31, pl. ii. figs. 28 & 27, Samarcand and Urgut, Turkestan.

Amnicola acrambleia and *rouvieriana*, spp. nn., Letourneux, Cabylie, i. p. 232, Cabylie.

Amnicola vindelica, sp. n., figured, but not described, by Marion, Ann. Sci. Nat. (6) i. pl. iii. figs. 1 & 2.

[*Bithynella*] *Paludinella utriculus*, Bastide de Sérou, Ariège, *curta*, Lusignan, *baudoni*, spring De la Pique, Port de Venasque, Gironde, *elliptica*, Ascaïn, Basses Pyrénées, spp. nn., Marion, Ann. Sci. Nat. (6) i. pp. 29-34, pl. iii. figs. 3, 4, and 7-12. *P. opaca* (Ziegl.), found near Belfort, p. 34, *P. eurystoma* and *anianensis*, spp. nn.?, figured but not described, *id.* l. c. figs. 5, 6, and 13, 14.

Belgrandia simoniana and *guranensis*, spp. nn.?, figured but not described, *id.* l. c. figs. 15-20.

Pomatiopsis intermedia, Tryon. Its habits observed near San Francisco, by J. C. Cooper; P. Cal. Ac. iv. (1872) p. 175. The eggs are enclosed in capsules, and the shells vary through incrustation with oxide of iron retarding their growth.

Stalioa, g. n., proposed by Brusina in his treatise on the fossil land and fresh-water mollusks of Croatia (see above, p. 130), for *Hydrobia*-like shells with expanded peristome. [Probably = *Belgrandia*, Bourg.]

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The recent *Bithynia costigera* (Beck) is referred to the fossil genus *Fossarulus* (Neumayr, JB. geol. Reichsanst. 1869); *id. op. cit.*

Lithoglyphus naticoides (Fér.), hitherto only known from the Danube, has been found in Holland, in the Old Maese, near Rhoon, by M. Schepman, who describes the living animal and radula. Tijdschr. Ned. Dierk. Ver. i. pp. 124-131, pl.

Skenea pellucida, sp. n., Monterosato, J. de Conch. xxii. p. 263, and Aradas & Benoit, Conch. viv. mar. Sicil. ii. p. 263, Mediterranean.

PALUDINIDÆ.

Paludina lecythis (Bens.) figured, from type, by Hanley & Theobald, Conchol. Ind. pl. lxxvi. fig. 6.

Paludina australis (Reeve); E. Smith, Moll. Voy. Ereb. & Terr. pl. iv. fig. 19.

Vivipara unicolor (Oliv.) = *biangulata* (Küst.) = *æthiops* (Reeve) = *polita* (Frauenf.), Egypt, and *dissimilis* (Müll.) = *fallax* and *maheyana* (Frauenf.), India; Jickeli, Verh. L. C. Ak. xxxvii. pp. 237-239.

Cleopatra bulimoides (Oliv.) has the inner side of the operculum granulated; *id. l. c.* p. 241, pl. vii. fig. 31. *C. verreauxiana* (Bourg., 1860) = *cyclostomoides* (Küst., 1852) = *egyptiaca* (Parreyss); *id. l. c.* pp. 242 & 243. Both from the Nile.

Bithynia sennariensis (Parreyss) = *savignyi* (Merian), with var. *adspersa*, distinct from *pulchella* (Hutt.); *id. l. c.* p. 245, pl. vii. fig. 32. *B. goryi* (Bourg., 1860) = *kuesteri* (Frauenf., 1862), Egypt; *id. l. c.* p. 244.

Bithynia ejecta, sp. n., Mousson, J. de Conch. xxii. p. 46, Lower Mesopotamia.

VALVATIDÆ.

Valvata nilotica, sp. n., Jickeli, Verh. L. C. Ak. xxxvii. p. 233, pl. vii. fig. 29, Alexandria.

AMPULLARIIDÆ.

Ampullaria ovata, var. n. *conglobata*, from Farafreh, Oasis of the Libyan desert, Martens, SB. Nat. Fr. 1874, p. 63.

Ampullaria catamarcensis, sp. n., Sowerby, P. Z. S. 1874, p. 600, pl. lxxii. fig. 4, Catamarca, Upper Peru.

Ampullaria canaliculata (Lam.) varieties, including *insularum* and *australis* (Orb.); Strobel, Malac. Argent. pp. 52-57, Argentine States.

Ampullaria (Asolene) platæ (Maton); *id. l. c.* pp. 57-59.

CÆCIDÆ.

Cæcum spinosum, sp. n., Folin, Fonds de la mer, ii. p. 84, pl. iii. fig. 1, and Fischer, Act. Soc. L. Bord. xxix. p. 203, Cape Breton, S. W. France, 45 fathoms.

Parastrophia asturiana, sp. n., Folin, *l. c.* p. 218, pl. xxix. fig. 7, and Act. Soc. L. Bord. xxix. pp. 203 & 204, Asturias and Bay of Biscay, 15-20 fathoms.

VERMETIDÆ.

Vermetus cariniferus (Gray); E. Smith, Moll. Voy. Ereb. & Terr. pl. i. fig. 23.

CALYPTRÆIDÆ.

Salensky's observations on the development of *Trochita sinensis* (L.) [Zool. Rec. ix. p. 137] criticized by P. Stephanoff, who published, some years ago, a paper on the same subject, in Trans. Soc. Kharkow, vii. (1873), and Bull. Mosc. xlv. (1873) pp. 115-123; the latter paper, written in German, containing a recapitulation of the former.

Crepidula patula (Desh.); radula by Tapparone-Canefri, Malac. viagg. Magenta, p. 71, pl. ii. fig. 6.

Crepidula walchi (Hermannsen), described by Walch in 1777, incorrectly spelt *walshi*; on its specific characters, Lischke, Jap. Meer. Conch. iii. p. 56.

NERITOPSIDÆ.

Neritopsis radula (L.). The operculum somewhat resembles that of *Nerita*: H. Adams, P. Z. S. 1874, pp. 584 & 585, pl. lxix. fig. 4; Soubervie & Montrouzier, J. de Conch. xxii. p. 109. [According to later information, *op. cit.* xxiii. pp. 198-204, it must be referred to the *Neritidæ*.]

SCALARIIDÆ.

Scalaria (Lam.). Nyst enumerates 162 recent species, besides 161 from tertiary, 51 from cretaceous, and 4 from jurassic beds; Ann. Mal. Belg. vi. Sowerby has completed the monograph of this genus in Reeve's Conchologia Iconica, parts 314 & 315, bringing it up to 125 (recent) species, on 16 plates; the following are new: *nuda*, fig. 110, *attenuata*, fig. 116, and *undulatissima*, fig. 121, locality unknown; *latifasciata*, fig. 117, *abbreviata*, fig. 124, *multiperforata*, fig. 125, Mauritius; *tenuilirata*, fig. 118, Japan; *subnudata*, new name for *delicatula*, H. Ad. (*nec* Crosse).

The geographical distribution of this genus is sketched out, and the species living in the West Indies are accurately enumerated, with several contributions on their synonymy, by O. A. L. Mörch, Vidd. Medd. 1874, pp. 250-268.

Scalaria cantrainii (Weinkauff, 1866) = *kusmici* (Brusina, 1869) = *muricata* (Tiberi, 1869, *nec* Risso); Monterosato, J. de Conch. xxii. p. 362. *S. hispidula*, (Monter., 1872); *id. l. c.* p. 264. Both from the Mediterranean.

[*Scalaria*] *Scala krebsei*, *pretiosula*, *swifti*, *novemcostata*, *spuria*, *spinosa*, *centiquadra*, *soluta* (Dunker, MS.), *volubilis*, *erectispina*, *micromphala*, *quindecimcostata*, *gradatella*, *undecimcostata*, *octocostata*, *turritellula*, *æospila*, *nautilæ*, *filaris*, (*Opalia*) *scæva* and *subvaricosa* (Dunker,

MS.), spp. nn., all from the West Indies, Mörch, *l. c.*; *S. principalis* (Pall.) and *lamellosa* (Lam.) recognized as West Indian species, *id. l. c.* pp. 253 & 261.

Scalaria lineolata (Sow.) = *lineata* (Kien., nec Say); Lischke, Jap. Meer. Conch. iii. p. 50.

Scalaria mariei (Crosse) fully described; Crosse, J. de Conch. xxii. p. 102, pl. ii. fig. 7, New Caledonia.

Cheletropis crenilabris, sp. n., Garrett, P. Ac. Philad. 1873, p. 215, pl. ii. fig. 18, Paumotu Island. [The genus *Cheletropis* is only the young stage of pectinibranchiate Gastropods.]

SCUTIBRANCHIA.

NERITIDÆ.

Nerita stricta, South Sea, and *novæ-caledoniæ*, New Caledonia; Baird, in Brenchley's Cruise of the Curaçoa, p. 438, pl. xxxviii. figs. 10, 11, & 12, 13.

Neritina subrugata, sp. n., *id. ibid.*, figs. 7-9, Salomon Islands.

Neritina karasuna, sp. n., Antioch, *meridionalis* (Phil.) var. n. *mesopotamica*, Diabekr, *belladonna* (Paw.), Alexandretta, and *euphratica*, Samava; Mousson, J. de Conch. xxii. pp. 34, 35, 16, & 49. *N. cinctella*, sp. n., and *anatolica*, var. n. *mesopotamica*, Mesopotamia; Martens, Vorderas. Conch. pp. 34 & 33, pl. v. figs. 43 & 42. *N. syriaca* (Bourg.), Taurus, allied to *fluviatilis* (L.); *id. l. c.* p. 33, pl. v. fig. 41.

Neritina (Mitrula) schæfflii, sp. n., Mousson, *l. c.* p. 49, Ghaes Island, Persian Gulf.

Clithon strigilatus, sp. n., Tapparone-Canefri, Malac. viagg. Magenta, p. 54, pl. i. fig. 6, Stephen's Island, Louisiade Archipelago.

TROCHIDÆ.

Phasianella wisemanni, sp. n., Baird, in Brenchley's Cruise of the Curaçoa, p. 436, pl. xxxviii. figs. 3 & 4, New Hebrides.

Turbo cornutus (Gmel.), varieties from Japan; *T. japonicus* (Reeve) is its young state. Lischke, Jap. Meer. Conch. iii. p. 62, pl. iv. figs. 7 & 8.

Calcar babelis, sp. n., P. Fischer, J. de Conch. xxii. p. 205, locality unknown.

Liotia gowlandi, sp. n., Brazier, P. Z. S. 1874, p. 672, pl. lxxxiii. figs. 1 & 2, Percy Island, N. E. Coast of Australia.

Cyclostrema. Monograph by Sowerby in Reeve's Conchologia Iconica, parts 314 and 315, 25 species, 3 plates.

Cyclostrema duplicatum (Lischke, 1872) fully described; Lischke, Jap. Meer. Conch. iii. p. 61, pl. iii. figs. 9 & 10.

[*Cyclostrema*] *Circulus formosissimus*, sp. n., Brugnone, Misc. Malac.

1873, p. 12, figs. 21 & 22: = *C. jeffreysi* (Monterosato, 1872, not described); Monterosato, J. de Conch. xxii. p. 260.

Adeorbis (S. Wood). Monograph by Sowerby in Reeve's Conchologia Iconica, parts 312 & 313, 21 species (none new), 2 plates.

Tinostoma. Monograph, *id. ibid.*, 8 species (none new), 1 plate.

Globulus giganteus and *monilifer* (Kien.). Varieties in colour; Lischke, Jap. Meer. Conch. iii. figs. 63 & 64.

Trochus (*Anthora*) *tuberculatus* (Gray); E. Smith, Moll. Voy. Ereb. & Terr. pl. i. fig. 1, from type.

Trochus (*Clanculus*) *tonnerrii*, sp. n., Nevill, J. A. S. B. (n. s.) xliii. pt. 2, p. 27, pl. i. fig. 3, Aden. *T. satrapius*, sp. n., Martens, Vorderasiat. Conch. p. 100, pl. vi. fig. 50, Persian Gulf. *Clanculus festivus*, sp. n., Tapparone-Canefri, Malac. viagg. Magenta, p. 58, pl. i. fig. 10, Bias Bay, China; *C. variegatus* (A. Ad.), *id. l. c.* p. 56, pl. i. fig. 11.

Trochus (*Monodonta*) *zeus*, ? New Holland, and *vermiculatus*, locality unknown, Fischer, J. de Conch. xxii. pp. 372 & 373. *Monodonta confusa*, sp. n., Tapparone-Canefri, *l. c.* p. 61, pl. i. fig. 8, Singapore.

Trochus (*Labio*) *subrostratus* (Gray); E. Smith, *l. c.* pl. i. fig. 14.

Trochus (*Euchelus*) *persicus*, sp. n., Martens, Vorderasiat. Conch. p. 101, pl. vi. fig. 51, and *T. horridus* (Phil.), Bushire, Persian Gulf. *T. pauperculus* (Lischke, 1872); Lischke, Jap. Meer. Conch. iii. p. 69, pl. iv. figs. 9–11, Yeddo.

Trochus (*Turcica*) *imperialis* (A. Ad. 1863) = *adamsianus* (Schrenck, 1867), from Yeddo; Lischke, *l. c.* p. 67, pl. iv. fig. 4; varieties, figs. 5 & 6.

Trochus (*Zizyphinus*) *consors* and *argenteonitens* (Lischke, 1872); *id. l. c.* pp. 65 & 66, pl. iv. figs. 2, 3, & 1. *Calliostoma affine* (Dall) very near *T. unicus* (Dunker); *id. l. c.* p. 64. *Eutrochus lessoneanus* [lessonea], sp. n., Tapparone-Canefri, Moll. viagg. Magenta, p. 59, pl. 1, fig. 9, New Zealand.

Trochus (*Chlorostoma*) *undulosus* (A. Ad.); E. Smith, *l. c.* p. 4, pl. i. fig. 15.

Trochus (*Omphalius*) *smithi*, sp. n., Tapparone-Canefri, *l. c.* p. 62, pl. i. fig. 13, Peru.

Trochus (*Monilea*) *warnefordi* and *masoni*, spp. nn., Nevill, J. A. S. B. (n. s.) xliii. pt. 2, pp. 27 & 28, pl. i. figs. 2 & 1, Andaman Islands.

Trochus (*Gibbula*) *fanuloides*, sp. n., Fischer, J. de Conch. xxii. p. 373, locality unknown. *T. kotschyi* (Phil.), varieties from the Persian Gulf; Martens, Vorderasiat. Conch. p. 99. *T. (G.) sanguineus* (Gray); E. Smith, *l. c.* pl. i. fig. 12. *Turbo phasianellus* (Desh., Moll. île Réunion) referred to *Trochus* on account of its operculum; Deshayes, J. de Conch. xxii. p. 157. *Gibbula angulata* (Eichwald, as *Trochus*, 1830) = *T. adriaticus* (Philippi, 1844), = *T. adansoni* of several faunists of the Adriatic Sea, is distinct from *T. adansoni* (Payr.), which is rare in the Adriatic, being found only in the southern parts of Dalmatia; *G. ivanicsi* (Brusina) belongs to it as a variety: Brusina, Secondo Saggio della malacologia Adriatica, 1872 (Bull. Mal. iv.).

Trochus (*Solariella*) *castus*, sp. n., Nevill, J. A. S. B. (n. s.) xliii. pt. 2, p. 27, pl. i. fig. 4, Ceylon.

Margarita (Leach). Monograph by Sowerby in Reeve's *Conchologia Iconica*, parts 316 & 317, 7 species, 1 pl.

Vitrinella pura, *liricincta*, *sculptilis*, *cælata*, and *nodosa*, spp. nn., Garrett, P. Ac. Philad. 1873, p. 213, pl. ii. figs. 13-17, Polynesia.

Stomatella. Monograph by Sowerby in Reeve's *Conchologia Iconica*, parts 310-313, bringing it up to 34 species, on 5 plates, and figuring, for the first time, *elegans* (Gray, Brit. Mus.), fig. 27, *elata* (H. Ad.), fig. 28, *dilecta* (H. Ad.), fig. 30, *clathratula* (H. Ad.), fig. 31, *modesta* (H. Ad.), fig. 34. *Stomatella granosa*, sp. n., Lambert, J. de Conch. xxii. p. 374, New Caledonia.

Stomatia. Monograph by Sowerby in Reeve's *Conch. Icon.* parts 312 & 313, 12 species, 2 pls.

Gena. Monograph, *id. ibid.*, 16 species, 2 pls.

Broderipia. Monograph, *id. ibid.*, 4 species, 1 pl.

HALIOTIDÆ.

Pleurotomaria (Defr.). The two known recent species figured in Reeve's *Conch. Icon.*, parts 310 & 311.

Haliotis gibba (Phil. ?, Reeve); E. Smith, *Moll. Voy. Ereb. & Terr.* pl. i. fig. 16.

FISSURELLIDÆ.

Emarginula (Lam.). Sowerby has completed its monograph in Reeve's *Conch. Icon.* parts 316 & 317, bringing it up to 70 species, figured on 9 plates. *E. oldhami*, fig. 69, Ceylon, and *tumida*, fig. 70, locality unknown: spp. nn.

Emarginula picta (Dunker) is distinct from *pulchra* (A. Ad.); Lischke, *Jap. Meer. Conch.* iii. p. 70.

Scutus corrugatus (Reeve); radula described by Tapparone-Canefri, *Malac. viagg. Magenta*, p. 70, pl. ii. fig. 8.

Scutus abnormis, sp. n., G. & H. Nevill, J. A. S. B. (n. s.) xliiii. pt. 2, p. 28, pl. i. fig. 12, Pulo Penang.

CYCLOBRANCHIA.

PATELLIDÆ.

Patella antipodum, sp. n., from New Zealand, *denticulata* (Martyn), and *redimiculum* (Reeve); E. Smith, *Moll. Voy. Ereb. & Terr.* p. 4, pl. i. figs. 25, 26, and 24.

CHITONIDÆ.

Trachydermon (Carpenter, 1865, as a sub-genus) is distinguished from *Callichiton* (Gray) by the short rows of gills; to it belong *Chiton marginatus* (Penn.), *albus* (L.), and *ruber* (L., Lowe) = *puniceus* (Couthony). Carpenter, *Ann. N. H.* (4) xiii. pp. 120 & 121.

Chiton (*Leptochiton*) *areus* (Reeve) and *sinclairi* (Gray); E. Smith, *Moll. Voy. Ereb. & Terr.* pl. i. figs. 9 & 17.

Chiton (Chætopleura) nobilis (Gray); *id. l. c.* fig. 8. *Chiton apiculatus* (Say), from New England, is also referred to *Chætopleura*; Carpenter, *l. c.* p. 119.

Chiton (Maugeria) japonicus (Lischke, 1873); Lischke, Jap. Meer. Conch. iii. p. 71, pl. 5, figs. 8–11, Nagasaki.

Chiton (Onithochiton) amicorum, sp. n., Baird, in Brenchley's Cruise of the Curaçoa, p. 445, pl. xl. fig. 7, Savage Island, Polynesia.

Tonic[i]ella, g. n., distinguished from *Tonicia* (Gray) by the short gill-rows, and the sharp, not pectinated, plates of insertion; type, *Chiton marmoreus* (Fabr.). Carpenter, *l. c.* p. 121.

Amacula (Amacula) defilippii, sp. n., Tapparone-Canefri, Malac. viagg. Magenta, p. 78, pl. i. fig. 15, Yokohama.

Stimpsoniella, g. n., distinguished from *Amacula* (Gray) by the want of pore-tufts; for *Chiton pallasi* (Midd.), from Alaska, and *C. emersoni* (Couth.), from New England. Carpenter, *l. c.* p. 123.

Chiton (Plaxiphora) terminalis (Carp. MS.), E. Smith, *l. c.* p. 4, pl. i. fig. 13, New Zealand.

Chiton mendicarius (Mighels), referred to *Hanleya* (Gray), the generic characters given by H. & A. Adams not being exact. Carpenter, *l. c.* p. 122.

Chiton (Acanthochætes) rubrilineatus (Lischke, 1873), from Nagasaki, fully described by Lischke, Jap. Meer. Conch. iii. p. 73, pl. v. fig. 12.

TECTIBRANCHIA.

TORNATELLIDÆ.

Ringicula nitida, sp. n., Verrill, Am. J. Sci. (3) v. [1873], p. 16, note, St. George's Bank, New England, 110 and 150 fathoms.

BULLIDÆ.

Cylichna cylindracea (Penn.), from E. Greenland, feeds on *Trochus (Margarita) helycinus*; radula and solid plates of the ventricle described, Möbius, Zweite Deutsche Nordpolarfahrt, ii. p. 250.

[*Cylichna*] *Bulla robagliana*, sp. n., Fischer, Fonds de la mer, i. p. 150, pl. xxiii. fig. 2, and Act. Soc. L. Bord. xxix. p. 197, Bay of Biscay, 60 fathoms.

Bulla quoyi (Gray); E. Smith, Moll. Voy. Ereb. & Terr. pl. i. fig. 11, type.

Amphisphyra quadrata, sp. n., Monterosato, J. de Conch. xxii. p. 280, Mediterranean.

Haminea zelandiæ (Gray); Smith, *l. c.* fig. 10, type.

Philine sculpta (A. Ad.) and *japonica* (Lischke, 1872), from Yeddo; Lischke, Jap. Meer. Conch. iii. pp. 76 & 77, pl. v. figs. 15, 16, & 13, 14.

Philine striatella, sp. n., Tapparone-Canefri, Malac. viagg. Magenta, p. 109, pl. ii. fig. 9 (shell and radula), Yokohama.

Aglaia gigliolii, sp. n., *id. l. c.* p. 110, pl. i. fig. 18, Japan.

LOPHOCERCIDÆ.

Lophocercus sieboldi (Krohn), from Majorca, anatomically described; its radula consists of unicuspidate teeth, one only in each row, and connected like a chain-saw, in this agreeing exactly not only with *Lobiger*, but *Pontolimax* (*Limapontia*) and *Elysia*; these four genera form an ascending series, beginning with the most simple naked *Pontolimax*, and finishing with *Lobiger*, which is provided with very distinct lateral lobes of the mantle and an external shell. A. Pagenstecher, Verh. Ver. Heidelb. (2) i. pp. 58-74; woodcut of a tooth, p. 70.

Lophocercus (*Cylindrobulla*) *souverbiei*, sp. n., Montrouzier, J. de Conch. xxii. p. 195, pl. vii. fig. 6, New Caledonia.

APLYSIIDÆ.

Aplysia punctata (Cuv., nec Philippi) and *cuvieri* (Chiaje) = *marginata* (Phil., viz Blainv.) described from sketches made by Lafont at Arcachon; P. Fischer, Act. Soc. L. Bord. xxix. pp. 193 & 194.

Phyllaplysia lafonti (Fischer) observed alive at Arcachon; radula and (supposed) spawn described; *id.* l. c. pp. 194-197.

Phyllaplysia punctulata, sp. n., Tapparone-Canefri, Malac. viagg. Magenta, p. 112, pl. ii. fig. 3 (animal and radula), Yokohama.

NUDIBRANCHIA.

PLEUROPHYLLIDIIDÆ.

R. BERGH, in Semper's Reis. Arch. Philippin. ii. p. 247, gives a new list of the known genera and species of this family, describing the following:—

Pleurophyllidia semperi (Bergh, 1860), p. 249, pls. xxv. fig. 1, xxxi. figs. 24 & 26, Philippines; *gracilis*, sp. n., pp. 250-255, pl. xxxi. figs. 6-21, Rombay; *lugubris*, sp. n., pp. 255-262, pls. xxxi. figs. 22 & 23, xxxii. figs. 1-17, Philippines; *pallida*, sp. n., pp. 262-265, pls. xxv. fig. 2, xxxii. figs. 18-29, Philippines.

Diphyllidia pustulosa (Schultz) found at Arcachon; P. Fischer, Act. Soc. L. Bord. xxix. p. 191.

Linguella (Blainv., 1825). The original specimen has been examined by Bergh, and recognized to be a species of *Sancara*, perhaps *quadri-lateralis* (Bergh); fresh particulars concerning this species and *L. (S.) jaira* (Bergh); Bergh, l. c. pp. 266-268, pls. xxxiv. figs. 23-26, xxv. fig. 1. *L. punctilucens*, sp. n., *id.* l. c. p. 269, pl. xxxiv. figs. 2-22, China Sea.

PLEUROLEURIDÆ.

The above new family proposed for *Pleuroleura*, g. n., near *Pleurophyllidia*, but wanting the gills; tentacular shield without caruncles; back broad, its lateral edge with numerous urticatory pores; jaws like those of *Pleurophyllidia*, but without masticatory process, and with a

smooth edge; digestive organs also like those of *Pleurophyllidia* [? = *Dermatobranchus*, Hasselt, insufficiently described]. *P. ornata*, sp. n., Philippines. R. BERGH, in Semper's Reis. Arch. Philippin. ii. pp. 277-285, pls. xxv. fig. 3, xxxiv. figs. 27-32, xxxv.

PHYLLIDIIDÆ.

Phyllidia rosacea and *loricata*, spp. nn., Bergh, J. Mus. Godeffr. ii. (1873) p. 67, pl. ix. Tahiti.

DORIDIDÆ.

Doris derelicta, *biscayensis*, *eubalia* (Fischer), and *tomentosa* (Cuv.) described by P. Fischer, Act. Soc. L. Bord. xxix. pp. 180-186.

Doridopsis indacus [*indigotina*], sp. n., Tapparone-Canefri, Malac. viagg. Magenta, p. 114, pl. i. fig. 16, Yokohama.

Goniodoris elegans (Cantr.), found at Arcachon, and described by Fischer, l. c. p. 186.

Goniodoris tryoni, sp. n., Garrett, P. Ac. Philad. 1873, p. 232, pl. iv. Society Islands.

Drepania, g. n., allied to *Ancula* and *Thecacera*; upper tentacule lamellar, with only one appendage, which is falciform; three plumose gills, provided on each side with a falciform lateral appendage. *D. fusca*, sp. n., Arcachon. Lafont, J. de Conch. xxii. pp. 369 & 370.

TRITONIDÆ.

Scyllæa. A species, apparently distinct from *pelagica* (L.), shortly described, but not named, from a sketch by Giglioli; Tapparone-Canefri, l. c. p. 115, note.

Melibe papillosa (Filippi); *id.* l. c. pp. 115-118, pl. ii. fig. 2, with anatomical details, Yokohama.

ÆOLIDIDÆ.

Cerberilla, g. n.; upper tentacles perfoliate, under tentacles elongate, dorsal papillæ situated on short pedicels; jaw smooth, teeth of the radula in a single row, irregularly denticulated. *C. longicirrho*, sp. n., Bergh, J. Mus. Godeffr. ii. (1873) p. 87, pl. xii. figs. 6-16, Samoa Islands.

Eolis coronata (Forb.), *grossularia* and *conspersa* (Fischer), from Arcachon, described by P. Fischer, Act. Soc. L. Bord. xxix. pp. 188-190.

LIMAPONTIIDÆ.

R. BERGH, in Semper's Reis. Arch. Philippin. ii. pp. 205-209, pl. xxvi. figs. 18-24, characterizes this family as follows:—body slug-like, minute; head depressed, its sides carinated or produced into simple feelers; eyes separated; no dorsal wings; foot continuous; pharynx as in *Elysia*; plates of the radula somewhat compressed, with a carinated hook; no ventricle (proventricle?); liver scarcely ramified;

penis armed with a sting. The known genera are *Limapontia* (Johnst.), = *Chalidis* (Quatref.), *Actæonia* (Quatref.), *Cenia* (A. H.) ? = *Fu[ci]cola* (Q. G.), and *Pelta* (Quatref.). *Limapontia capitata* (Müll.) and its var. *islandica* (Steenstrup) described. Sketches of *Pelta prasina* (Mörch), pl. xxiv. figs. 27-29.

PULMONATA.

C. Semper, Reis. Arch. Philippin. iii. pp. 129-168, continues his classification of *Helicidæ* [see Zool. Rec. x. p. 155] in the following manner:—

Sub-family 2, *Helicinæ*; second group *Aulacognatha*, jaw narrow, finely striated. *Philomycus*, *Cionella*, *Tornatellina*, *Stenogyra*, *Endodonta*.

Third group, *Odontognatha*: jaw ribbed or strongly striated, the ribs projecting at the cutting edge.

First subdivision, without accessory glands to the genital organs:—

Achatina (with sub-genera *Limicolaria* and *Perideris*, but excluding *Liguus*), *Amphidromus*, *Bulimus* (with sub-genera *Borus*, *Dryptus*, *Pachyotus*, *Scutalus*, and *Plectostylus*), *Bulimulus* (with sub-genera *Mesembrinus*, *Thaumastus* and *Liparus*), *Ostotomus* (with sub-genera *Ostotomus*, *Pelecychilus*, *Liostracus*, *Mormus*, *Placostylus*, and *Charis*), *Partula*, and *Hadra*. To this division belong also *Pleurodonta invalida* (Ad.), *Helix albilabris* and *thyreoides* (Say), *Polygyra plagioglossa* (Pfr.), *Helix vittata* (Müll.) *H. argillacea* (Fér.) and *Bulimus siamensis* (Pf.).

Second subdivision, with accessory glands to the genital organs:—

Cochlostyla, including *Corasia* and *Azina*, but excluding *Chloræa*.

BINNEY gives a recapitulation of his researches on the dentition in many sub-genera of *Helix* and *Bulimus*, P. Ac. Philad. 1874, pp. 54-59, and makes some general remarks on the gradual modification of the lateral teeth in the radula of the *Helicidæ*, Not. Am. Land Shells, ii. pp. 39 & 40.

ONCHIDIIDÆ.

Onchidium schrammi, sp. n., from Guadeloupe; no jaw, dentition similar to that of *Peronia*. Bland & Binney, Ann. Lyc. N. York, x. pp. 339-341, pl. xvi. figs. 3-5.

Onchidella griseofusca, sp. n., Tapparone-Canefri, Malac. viagg. Magenta, p. 101, pl. ii. fig. 1, Singapore.

VAGINULIDÆ.

Vaginulus solea (Orb.) var. *bonariensis*, Strobel, Malac. Arg. p. 3, woodcut, Buenos Ayres.

Veronicella occidentalis (Guild.). On its external appearance, jaw and dentition; Bland & Binney, Ann. Lyc. N. York, x. p. 339.

TESTACELLIDÆ.

Daudebardia platystoma, sp. n., Letourneux, Cabylie, i. p. 216, Tala Guizan, Cabylia.

Diplomphalus mariei (Crosse) var., and *D. vaysseti* (Marie, as *Helix*, 1871), Crosse, J. de Conch. xxii. pp. 387 & 388, pl. xii. figs. 1 & 2, New Caledonia.

Streptaxis layardiana and *cingalensis* (Bens.), and *exacuta* (Gould) figured; Hanley & Theobald, Conch. Ind. pl. xcvi. figs. 1 & 4, 2 & 3, & 8-10.

Ennea denticulata (Morelet) var. *5-plicata* = *E. papillifera* (Jickeli, 1873) and var. n. *hildebrandti*, Jickeli, Verh. L. C. Ak. xxxvii. pp. 30 & 31, pl. iv. figs. 1 & 2, Bogos Territory, northern borders of Abyssinia. *Pupa* (*Ennea*) *blanfordi* (Austen), *vara* (Bens.), and *fartoides* (Theob.) figured; Hanley & Theobald, l. c. pl. c. figs. 2, 3, & 5.

Gonospira palanga (Fér.) and *newtoni* (H. Ad.); on their genital organs and the dentition of several other species, Binney, P. Ac. Philad. 1874, p. 47.

Gonospira metableta, new name for *dupontiana* (Crosse, 1873, nec Nevill), *rodriguezensis* (Crosse), and *chlois* (Crosse) fully described by Crosse, J. de Conch. xxii. pp. 224-226, pl. viii. figs. 5-7, Rodriguez Island.

Glandina solidula (Pfr.), *semitarum* (Rang.), and *philipsi* (Ad.); dentition as usual in the genus. Bland & Binney, Ann. Lyc. N. York, x. p. 347, and P. Ac. Philad. 1874, p. 49.

Oleacina flexuosa (Pfr.), 65 mill. long, from "Aux Cayes," West Indies; Bland, Ann. Lyc. N. York, xi. p. 72.

Spiraxis cingalensis, *layardi*, *walkeri*, and *haughtoni* (Bens.), the last = *pealii* (Tryon), figured by Hanley & Theobald, Conch. Ind. pl. lxxix. figs. 1-6.

Ravenia (Crosse, 1873 [Zool. Rec. x. p. 157]), fully described by Crosse, J. de Conch. xxii. pp. 66-69, pl. ii. fig. 4, Curaçoa.

VITRINIDÆ (OXYGNATHA).

Philomycus, see HELICIDÆ.

Amalia maculata, sp. n., Koch & Heynemann, JB. mal. Ges. i. p. 152, pl. vi. fig. 5, and Fedchenko, Turkest. Moll. p. 2, pl. i. fig. 4, and pl. iii. fig. 35 (radula and internal shell), Samarkand, Turkestan.

Limax (*Agriolimax*) *fedtschenkoni* [-oi or -onis], Koch & Heynemann, l. c. p. 153, pl. vi. fig. 6, and Fedchenko, l. c. p. 1, pl. iii. fig. 36 (radula and internal shell), Schachimardan, Turkestan.

Limax (*Agriolimax*) *jickelii* (Heynemann), sp. n., Jickeli, Verh. L. C. Ac. xxxvii. p. 31, pl. i. fig. 1, radula, and pl. iv. fig. 3, Abyssinia.

Limax argentinus, sp. n., Strobel, Malac. Arg. p. 6, San Carlos, Mendoza, Argentine States.

Limax flavus (L.), *agrestis* (L.), *maximus* (L.), *campestris* (Binn.), and *hewstoni* (Cooper); notes on their dentition by Binney, Ann. Lyc. N. York, xi. pp. 20-23; the last, from California, belongs to the sub-genus *Amalia*.

Parmacella olivieri (Cuv.) from Samarkand and Taschkent, young external and old internal shell and soft parts; Martens, in Fedchenko's Turkest. Moll. p. 3, pl. i. fig. 1, with enumeration of the known species of the genus.

Parmacella alexandrina (Ehrenb.): its shell described and distinguished from that of other species by Jickeli, Verh. L. C. Ak. xxxvii. pp. 33-35, pl. iv. fig. 4.

Parmacella dorsalis, sp. n., Mousson, JB. mal. Ges. i. p. 3, pl. i. fig. 1, Valleys of Mount Atlas, Morocco.

Vitrina hians (Rüpp.), *rueppelliana* (Pfr.), *jickelii* (Krauss, MS.), sp. n., *semirugata* (Jick.), *isseli* (Morel., 1871) = *martensi* (Jick.), and varr. *deveza* (Jick., 1873) and *cailliaudi* (Morel., 1872) = *planulata* (Jick. 1873), and *helicoidea* (Jick.), all from Abyssinia, described and figured by Jickeli, Ver. L. C. Ak. xxxvii. pp. 36-44, pl. iv. figs. 5-12.

A young *Vitrina*-like shell, set with granules arranged in spiral lines, with peculiar radula, found in the Bogos territory, N. E. Africa, described; *id. l. c.* pp. 45-47, pls. i. fig. 2, iv. fig. 13.

Vitrina peguensis (Theob.), *salus* (Bens.), and *christianæ* (Theob.) figured; Hanley & Theobald, Conch. Ind. pls. lxxv. figs. 2, 3, & 8, 9, lxxvi. figs. 7 & 10.

Vitrina freycincti (Fér.); E. Smith, Moll. Voy. Ereb. & Terr. pl. iv. fig. 4.

Vitrina (?) *rugulosa*, sp. n., C. Koch, Karakusak, in the mountains of Kokand, and *conoidea*, sp. n., Martens, Valley of Sarafschan, in Fedchenko's Turkest. Moll. pp. 7 & 8, the latter pl. i. fig. 5.

Helicarion pallens (Morelet); Jickeli, Ver. L. C. Ak. xxxvii. p. 48, pl. i. fig. 3 (radula), and pl. iv. fig. 14, Bogos.

Macrochlamys sogdiana (Martens, 1869, as *Helicarion*) and *turanica*, sp. n., Martens, in Fedchenko's Turkest. Moll. pp. 5 & 7, pls. i. figs. 2 & 3 (shell), iii. fig. 37, genital organs, Valley of Sarafschan, Ferghana, and Taschkent.

Microcystis abyssinica and *vesti* (Jickeli, 1873, as *Hyalina* (fully described by Jickeli, Ver. L. C. Ak. xxxvii. pp. 50-53, pl. iv. figs. 15 & 16, Abyssinia, with notes on the foot, jaw, and radula of the last.

Nanina (Microcystis) chamissoi (Pfr.). Dentition; Bland & Binney, Ann. Lyc. N. York, x. p. 338, pl. xv. fig. 3.

Nanina caldwelli (Bens.), *rawsoni* (Barcl.), *argentea* (Reeve), *impli-cata* (Nevill), *stylodon* (Pfr.), and *philyrina* (Morelet). Dentition (that of the last-named different from the others); Binney, P. Ac. Philad. 1874, p. 48.

Nanina inversicolor (Fér.). Genital organs; *id. ibid.*

Nanina limbifera (Martens), *fulvizona* (Mouss.), *wallacii* (Pfr.), and *semisculpta* (Martens); Pfeiffer, Novitat. iv. pl. cxxviii. figs. 1-6.

Hemiplecta beddomii, sp. n., Blanford, Ann. N. H. (4) xiv. p. 406, Travancore.

Trochomorpha gorontalensis (Martens); Pfeiffer, *l. c.* fig. 7, Celebes. *Helix (Troch.) mersianoides*, sp. n., Garrett, P. Ac. Philad. 1873, p. 237, pl. iii. fig. 72, Tahiti.

Zonites algirus (L.); its spermatophore or capreolus described by

E. Dubreuil, C. R. lxxv. [1871] pp. 1126 & 1127; translation in Ann. N. H. (4) xi. [1873] pp. 235 & 236.

Zonites capnodes (Binn.), *friabilis* (Binn.), *inornatus* (Say), *sculptilis* (Bland), *elliotti* (Redf.); notes on their dentition and genital organs. A duct ascertained to exist in the last and in *Z. internus* (Say). Binney, Ann. Lyc. N. York, xi. pp. 24-26, pls. v. figs. 1 & 2, ii. fig. 4. *Z. levigatus* (Pfr.) and *demissus* (Binn.), genital organs; Binney, P. Ac. Philad. 1874, pp. 39 & 42.

Hyalina æquata (Mouss.) and *nitelina* (Bourg.) from High Mesopotamia; Mousson, J. de Conch. xxii. pp. 18 & 19. [*Hyalina*] *Zonites subglaber* (Bourg.); Desmars, Cat. Moll. Ile & Vilaine, p. 18, Brittany.

[*Hyalina*] *Zonites hammonis* (Ström), *petronella* (Charp.), and *pura* (Aldw.) defended as 3 distinct species, the last prevailing in lower countries, the first in sub-Alpine and the second in Alpine regions, all three in Scandinavia; the third is more commonly pale-coloured, whitish, seldom horn-coloured, *Z. hammonis*, on the contrary, commonly of horny colour, seldom pale greenish. Westerlund, Mal. Bl. xxiv. pp. 66-70.

Hyalina subrimata (Reinh.). Its differences from *crystallina* (Müll.), *subterranea* (Bourg.), and *diaphana* (Stud.) once more pointed out by Reinhardt, Arch. f. Nat. xl. pp. 13-15.

[*Hyalina*] *Zonites hamelianus*, sp. n., Crosse, J. de Conch. xxii. p. 104, New Caledonia.

Hyalina (Ammonoceras) argentina, sp. n., Strobel, Malac. Arg. p. 9, Angostura and Bahia Blanca, Argentine States.

Helix ammonoceras (Pfr.) from the Island of New Granada, West Indies; Bland, Ann. Lyc. N. York, xi. p. 86.

Helix bermudensis (Pfr.) proved by its dentition to belong to *Hyalina*; Bland & Binney, op. cit. x. p. 221. *Hyalina nelsoni*, sp. n., nearly allied, sub-fossil in caverns at Tucker's Town, Bermuda; Bland, op. cit. xi. p. 77.

[*Conulus*] *Zonites gundlachi* (Pfr.); dentition, Bland & Binney, Ann. Lyc. N. York, x. p. 335, pl. xv. fig. 1. *Helix (Conulus) elleryi* and *russelli*, spp. nn., Brazier, P. Z. S. 1874, p. 668, pl. lxxxiii. figs. 3, 4, & 13, 14, Fitzroy Island, N. E. Australia.

[G. n. ?] *Zonites lamsingi* and *stearnsi*, sp. n., both from Astoria, Oregon, the first with odontognath jaw and aculeate marginal teeth [shell like that of *Conulus*]; Bland, Ann. Lyc. N. York, xi. pp. 74-77, with woodcuts.

Macrocyclus (Beck). *Helix euspira* (Pfr.), *baudoni* (Petit), and *concolor* (Fér.) belong, according to their jaw and dentition, to this genus; the last is viviparous; Bland, Ann. Lyc. N. York, xi. pp. 73 & 74. Variation in size of *M. concolor*, id. l. c. p. 78. Genital organs of *M. vancouverensis* (Lea); Binney, P. Ac. Philad. 1874, p. 42, pl. iv. fig. 1.

HELICIDÆ.

Philomycus (Raf.) = *Tebennophorus* (Binn.) and *Pallifera* (Morse). Semper has examined specimens of *Ph. carolinensis*, *australis*, and *bilineatus* (*Incilaria*) and does not find any generic difference, except the

jaw; this is strongly ribbed in *australis*, feebly ribbed or rather striated in *bilineatus*, and either smooth or feebly striated in *carolinensis*; he thinks that in this genus the quality of the jaw cannot be maintained as a generic character, as it varies even in the species; Reis. Arch. Philippin. iii. pp. 129–132. *Tebennophorus carolinensis* (Bosc.); note on its generative organs by H. C. Chapman, P. Ac. Philad. 1874, p. 79. *Pallifera wetherbyi*, sp. n., Binney, Ann. Lyc. N. York, xi. p. 31, jaw and dentition, pl. ii. figs. 1 & 2.

Geomalacus maculosus (Allman), genital system; Binney, Not. Am. Land Shells, ii. p. 31, pl. v. fig. 10.

Ariolimax niger and *californicus* (Coop.), and ? *columbianus* (Gould); anatomy by Binney, P. Ac. Philad. 1874, pp. 33–38, pls. ii. & xi.

Hemphillia glandulosa (Bland & Binney), genital organs; *id. l. c.* p. 39, pl. iii. figs. 5 & 6.

Sagda haldemanni (Ad.). The radula agrees with that of *Helix*; *id. l. c.* pp. 54 & 55, pl. ix. fig. 4.

Leucochroa fimbriata (Bourg.) var. *illicita*, Mousson, J. de Conch. i. p. 6, Alexandretta. On this species and *cariosa* (Ol.); Martens, Vorderas. Conch. p. 1. *L. boissieri* (Charp.), dentition as in *Helix*; Binney, *l. c.* p. 55, pl. ix. fig. 3.

Leucochroa turcica (Chemn.), *mogadorensis* (Bourg.), *mograbina* (Morelet), and *degenerans*, sp. n., all from Morocco and nearly allied; Mousson, JB. mal. Ges. i. pp. 5–9, pl. i. figs. 2–5.

Patula strigosa (Gould), genital organs; Binney, P. Ac. Philad. 1874, p. 41.

Guesteria powisiana (Pfr.) from Marmato, Western Cordillera, about 5000 feet; Bland, Ann. Lyc. N. York, xi. p. 77.

Endodonta bursatella (Gould) anatomically examined by C. Semper; genital organs simple, without accessory glands; jaw striated, similar to that of *Helix rotundata*; lateral teeth of the radula three-pointed. Reis. Arch. Philippin. iii. pp. 135 & 136, pl. xvi. fig. 18. *E. philippinensis*, *constricta*, *irregularis*, and *lacerata*, spp. nn., *id. l. c.* pp. 140 & 141, Philippine Islands.

Helix. The variations of bands in the genus *Helix* are discussed by S. Clessin, who distinguishes (among the European species) the following 3 principal groups, characterized by similar arrangement of the bands:— (1) Typical, 5 bands; the sub-genera *Tachea*, *Macularia*, *Iberus*, and *Pomatia* [*Pentatonia*, Ad. Schmidt]. (2) 4 bands, but these often split into a large number of bandlets; *Xerophila*. (3) 1 to 3 bands; the sub-genera *Campylæa*, *Chilotrema*, *Arionta*, and *Fruticicola*. JB. Ver. Augsb. xxii. pp. 52–67.

Helix. Species from Europe and adjacent countries:—

S. Clessin has examined the different species allied to and often united with *Helix rufescens* (Penn.) = *striolata* (C. Pfr.), of which he describes and figures a var. *subcarinata*, adopting the following as distinct species:—*H. clandestina* (Hartm.), *danubialis*, sp. n., *montana* (Stud., C. Pfr.) = *erecta* (Hartm.) = *rufescens*, var. *minor* (Jeffer.), and *cæolata* (Stud.). JB. mal. Ges. i. pp. 177–194, pl. viii. figs. 1–6.

The same author distinguishes the following species allied to *hispid*a (L.):—*H. concinna* (Jeffr.), *hispid*a, var. n. *septentrionalis*, var. *nana* (Jeffr.), *H. putoni*, sp. n., Belgium and North Eastern France, *sericea* (Müll., Drap.), *depilata* (C. Pfr.) = *liberta* (Westerlund), *granulata* (Alder) = *rubiginosa* (A. Schmidt), *expansa*, sp. n., Bavaria, *corneola*, sp. n., Bavarian Alps, *dubia*, sp. n., Innsbruck, Tyrol, *plebeia* (Drap.), *pseudosericea* (Benoit), *terrena*, sp. n., from German diluvial layers ("Löss"), all described, and most figured. *Tom. cit.* pp. 305–336, pls. xii. & xiii.; the last also Nachr. mal. Ges. 1874, pp. 46 & 47.

Helix (*Fruticicola*) *muscicola* (Bourg.), Beirut; Martens, Vorderas. Conch. p. 1, pl. i. fig. 1, var. n. *merssinae*, Mousson, J. de Conch. xxii. p. 13, Merssina, Asia Minor. *H. pilota* (Bourg.); Desmars, Cat. Moll. Ile et Vilaine, p. 27, Brittany.

H. (Carthusiana) obstructa (Fér.), jaw and radula; Jickeli, Verh. L. C. Ak. xxxvii. p. 64, pl. i. fig. 5.

H. (C.) longipila, sp. n., Mousson, JB. mal. Ges. i. p. 85, Djebel Hadid, Morocco.

[*Vallonia*] *Helix adela*, sp. n., Westerlund, Mal. Bl. xxiv. p. 57, from peat-moors in Ystad, Sweden, very near *pulchella* (Müll.), extinct.

[*Xerophila*] *Helix thymorum* (Alten) from Augsburg, distinct by its long sagitta from *striata* (Müll.), and by its distinctly costulate shell from *candidula* (Stud.); Clessin, Nachr. mal. Ges. 1874, p. 21. *H. ignota* (Mabille) and *danieli* (Bourg.); Desmars, l. c. pp. 28 & 29, Brittany.

Helix (Xerophila) derbentina (Andr.) from Transcaucasia, Mesopotamia, and Persia; Martens, Vorderasiat. Conch. pp. 10 & 11, pl. i. figs. 4, 5, & 7–9: from Turkestan, *id.* in Fedchenko's Turkest. Moll. p. 15, pl. i. fig. 10; var. n. *suberrans*, from Merssina, in Asia Minor, Mousson, J. de Conch. xxii. p. 9. *H. subkrynickyana*, sp. n., Mousson, l. c. Palestine, Syria, and Kurdistan. *H. commeata* and *mesopotamica*, spp. nn., *id.* l. c. pp. 21, 22 & 37, Mesopotamia. *H. bargesiana* (Bourg.) and *joppensis* (Roth), both from Beirut; Martens, Vorderasiat. Conch. p. 11, pl. ii. figs. 10 & 11.

H. (Xerophila) camerata and *subapicina*, spp. nn., Mousson, JB. mal. Ges. i. p. 12, pl. iv. figs. 1 & 2, Mogador.

H. (Heliomanes) simulata (Fér.) from Alexandria, jaw and radula; Jickeli, Ver. L. C. Ak. xxxvii. pp. 86 & 87, pl. i. fig. 11.

H. (Helicella) vestalis (Parr.) from Alexandria, varieties of shell, jaw and radula; *id.* l. c. pp. 88 & 89, pl. i. fig. 12: and from Aleppo and Beirut, Martens, Vorderasiat. Conch. p. 10, pl. i. figs. 4 & 5.

H. (Turricula) philammia (Bourg.) probably = *tuberculosa* (Conrad), and is not from Egypt; Jickeli, l. c. p. 93.

H. (Cochlicella) duplicata, sp. n., Mousson, JB. mal. Ges. i. p. 83, pl. iv. fig. 3, Mogador. *H. (C.) terveriana* (Webb) again found near Mogador and described, p. 84.

H. argonautula (Webb & Berth.) typical from Morocco, and var. n., *canariensis*, from the Canaries; *id.* l. c. pp. 81 & 82.

Campylaea. A list of the European species of this sub-genus, arranged in smaller groups, is given by C. Westerlund, Mal. Bl. xxiv. pp. 54–57.

Helix [*cingulata*, var.] *hermesiana*, sp. n., Pini, Atti Soc. Ital. xvii. p. 7, Alps, near Bergamo, Lombardy. The author adds some remarks on the different varieties of *H. cingulata* (Stud.), which he adopts in a rather extended sense, combining also *H. preslii* (Schmidt) with it. An abstract in JB. mal. Ges. ii. pp. 172-175. P. Strobel judges it to be a variety of *H. frigida* (Cristof.), and criticises several statements and systematic views of Pini; Atti Soc. Ital. xvii. Oct. and Dec. 1874.

H. (Fruticocampylæa) raverii (Fér.) and allied Caucasian species; Martens, Vorderas. Conch. pp. 8 & 9, pl. i. figs. 2 & 3.

H. strigata. Müller's species of this name is not *strigata* (Fér.); Martens, Nachr. mal. Ges. 1874, p. 13.

H. (Macularia) rerayana, *beaumieri*, *atlasica* [1], and *prædisposita*, spp. nn., Mousson, JB. mal. Ges. i. pp. 87-92, pl. iv. figs. 4-7, Valleys of the Atlas, Morocco, the last sub-fossil, *H. vermiculosa*, sp. n., Morelet, J. de Conch. xxii. p. 179, Morocco.

H. guttata (Olivier), *escheriana* (Mouss.), and *dschulfensis* (Dubois) from High Mesopotamia, and allied species, discussed by Mousson, J. de Conch. xxii. pp. 24-28; also by Martens, Vorderas. Conch. pp. 14 & 15, pls. ii. fig. 15, iii. figs. 16-19.

H. atrilabiata (Kryn.) var. *stauropolitana* (Ad. Schmidt), *pallasi* (Dubois), *lenkoranea* (Mouss.) = *hyrcana* (Dohrn) and var. n. *nemoraloides*, Transcaucasia and southern shore of the Caspian Sea; Martens, Vorderas. Conch. pp. 12-14, pl. ii. figs. 12-14.

H. (Pomatia) melanostoma (Drap.) from Alexandria, jaw, radula, and sagitta; Jickeli, Verh. L. C. Ak. xxxvii. pp. 83 & 84, pl. i. fig. 10.

H. figulina (Parr.) and *oniziomicra* (Bourg.) from High Mesopotamia, Mousson, J. de Conch. xxii. pp. 19 & 20. *H. buchi* (Dubois), Caucasus, *taurica* (Kryn.), Transcaucasia, *lucorum*, var. n. *euphratica*, Orfa, *obtusalis* (Ziegl.), Odessa and western extremity of the Caucasus, *cincta* (Müll.) var. n. *anctostoma*, Orfa; Martens, l. c. pp. 16-20, pl. xiv. figs. 20-24.

H. lenibaria, *zonitomæa*, *nicaisiana*, *berbruggeriana*, *rusicadensis*, and *aphæa*, spp. nn.; Letourneux, Cabylic, i. p. 218, Cabylic.

Helix. African species:—

H. (Patula) abyssinica, sp. n., Jickeli, Verh. L. C. Ak. xxxvii. p. 58, pl. iv. fig. 20, Abyssinia.

H. (Acanthinula) steudneri, new name for *membranacea* (Jickeli, 1873, pre-occupied); *id.* l. c. p. 60, pl. iv. fig. 21, Abyssinia.

H. (Zenobia) pilifera (Martens); *id.* l. c. p. 61, pl. iv. figs. 22 & 23, Abyssinia.

H. (Monacha) beccarii, sp. n., *id.* l. c. p. 62, pl. iv. fig. 24, Bogos, nearly allied to *ciliata* (Venetz), with which it has been wrongly identified by Morelet.

H. (Eulota) darnaudi (Pfr.) = *isseli* (Morelet), full-grown shell, jaw and radula described; *id.* l. c. pp. 67-69, pls. i. fig. 6, iv. fig. 25, Abyssinia.

H. (Eremophila) desertorum (Forsk.), varieties of the shell; *id.* l. c. pp. 72-75, jaw and radula, pp. 76 & 77, pl. i. figs. 7 & 8. *H. (E.) deser-*

tella (Jickeli, 1872); *id. l. c.* pp. 77-79, shell, jaw, radula, and sagitta figured, pls. i. fig. 9, iv. fig. 26, coast of Red Sea.

H. [Erepta?] rodriguezensis (Crosse, 1873), Crosse, J. de Conch. xxii. p. 230, pl. viii. fig. 1, Rodriguez Island.

H. menkeana (Pfr.); E. Smith, Moll. Voy. Ereb. & Terr. pl. iv. fig. 9.

Helix. Species from Central and Eastern Asia:—

H. rufispira, rubens, and *phæ[o]zona*, spp. nn., Martens, in Fedchenko's Turkest. Moll. pp. 9, 12 & 13, pls. i. figs. 6, 7 & 8, shells, iii. fig. 38, jaw, radula, and sagitta of the first, fig. 39, jaw and radula of the third, Valley of the Sarafschan in Turkestan, the first in mountains up to 9500 feet, the last in Kokand.

H. semenowi and *plectotropis* (Martens, 1864), from the Tianschan; *id. l. c.* pp. 16 & 17, pl. i. figs. 12 & 11.

H. subsimilis and *submissa*, spp. nn., Deshayes, N. Arch. Mus. ix. pp. 10 & 11, pl. ii. figs. 28, 29, 30-32, Moupin, E. Thibet. On the same plate, figs. 1-27, ten species from the same locality, described in 1871 [see Zool. Rec. viii. p. 153], are figured.

H. burtini, nucleus, hongkongensis, obscura, pekinensis, luctuosa, buvignieri, subrugosa, and *perforata*, spp. nn., from China, figured but not described; *id. l. c.* pl. iii. figs. 1-32.

H. sanis and *galerus* (Bens.), Hanley & Theobald, Conch. Ind. pl. lxxxiii. figs. 1 & 2; *zoroaster*, var. *concolor* (Theobald), pl. lxxxvi. fig. 2; *fritillaria* (Bens.), *ibid.* figs. 8-10; *barrakporensis* (Pfr.), pl. lxxxvii. fig. 7; *macropleuris* (Bens.), *ibid.*, fig. 10; *compluvialis* (Blanf.), pl. lxxxviii. figs. 1 & 4; *consepia* (Bens.), *ibid.*, figs. 5 & 6; *petrosa* (Hutt.), *ibid.*, figs. 7 & 10; *vilipensa* and *petasus* (Bens.), pl. lxxxix. figs. 4-6, 8 & 9; *levicula, causia*, and *pauzellula* (Bens.), pl. xc. figs. 1 & 4, 2 & 3, & 7-9; *honesta* (Gould, nec Reeve), *ibid.*, fig. 10.

H. vittata (Müll.), flagellum spirally twisted; *H. argillacea* (Fér.), flagellum double; Semper, Reis. Archip. Philippin. iii. p. 163, pl. xv. fig. 19. *H. similis* (Fér.), radula; Binney, P. Ac. Philad. 1874, p. 55, pl. ix. fig. 6.

Helix (Plectopylis). All known species arranged according to their inner plaits, and the following described:—*H. (P.) serica*, sp. n., Henozdan, Burrail range, above 5000 feet, *shiroiensis*, sp. n., Shiroifurar, N. E. of Manipur, 8000-9000 feet, *nagaensis*, sp. n., Prowi, Naga Hills, 5000 feet, *manipurensis*, sp. n., Manipur, 3000-4000, and *pseudophis* (Blanford, MS.), Thayatmyo, in Pegu. The plaits serve probably as barriers against intruding insects. Godwin-Austen, P. Z. S. 1874, pp. 608-613; the new species and the plaits of some others figured, pls. lxxiii. & lxxiv.

H. (Acavus) phoenix (Pfr.), dentition; Binney, P. Ac. Philad. 1874, p. 58, pl. ix. fig. 11.

H. (Camena) lutilabris, sp. n., Möllendorff, JB. mal. Ges. i. p. 79, Kinkiang, Kiangsi, China.

H. sanziana (Hombr. & Jacq.) var.; Semper, Reis. Archip. Philipp. iii. pl. ix. fig. 10.

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Helix. Species from Australia and adjacent islands :—

Hadra (Alb.). Under-surface of the foot with a distinct middle area ; genitals simple ; in some species, a flagellum ; kidney long ; bursa copulatrix attached to the oviduct ; jaw ribbed. *H. bipartita*, *gilberti*, *pachystyla*, *prunum*, *appendiculata*, *basalis*, *grayi*, *lessoni*, and *cerata* examined by Semper, Reis. Arch. Philippin. iii. pp. 159–161 ; genital organs, pl. xiv. figs. 2, 11 & 12 ; radula, pl. xvii. figs. 15, 16, 21, 22 & 24.

Helix appendiculata (Pfr.) described ; Tapparone-Canefri, Mal. viagg. Magenta, p. 90.

H. cozi (Crosse), *blomfieldi* (Cox), and *macleani* (Cox) ; *id. l. c.* pp. 92 & 93, pls. ii. figs. 7 & 5, iii. fig. 1 (all from Australia).

H. isis and *lais* (Pfr.) ; Pfeiffer, Novitat. iv. pl. cxxvi. figs. 1–5, 6 & 7. *H. richardsoni* and *millestriata*, spp. nn., E. Smith, Moll. Voy. Ereb. & Terr. p. 2, pl. iv. figs. 14 & 5, Depuch Island, W. Australia. *H. bipartita* (Fér.), *cyclostomata* (Guill.), *nigrilabris* (Martens), *strangii* (Pfr.), and *leptogramma* (Pfr.), all from Australia, figured ; *id. l. c.* pl. iv. figs. 11, 13, 16, 17, & 18.

H. calliope, *alleryana*, *noumeensis*, and *minutula* (Crosse), from New Caledonia ; Crosse, J. de Conch. xxii. pp. 97–101, pls. ii. figs. 1 & 2, iii. figs. 5 & 6. *H. bazini*, *prevostiana*, *corymbus*, *taslii*, *vimontiana*, spp. nn., and *costulifera* (Pfr.) var., New Caledonia, *id. l. c.* pp. 104–108, 180 & 181, 388–390, the first four figured, pls. iv. figs. 1 & 2, xii. figs. 3 & 4. *H. saburra*, sp. n., Gassies, *tom. cit.* p. 207, New Caledonia. *H. rufotincta*, and *inculta*, spp. nn., *id. l. c.* pp. 376 & 377, New Caledonia.

H. kivi, *mariae*, *coma*, *busbii*, and *dunniae* (Gray) from New Zealand ; E. Smith, Moll. Voy. Ereb. & Terr. pl. i. figs. 1–4, & 7.

Helix. North American Species :—

H. bracteola (Fér.), from Martinique, = *vortex* (Pfr.) ; Bland, Ann. Lyc. N. York, xi. p. 79.

H. (Strobila) hubbardi (Brown) = *vendryesiana* (Gloyne), from Georgia, Texas, and Jamaica ; *id. l. c.* p. 86.

H. (Polygyra) plagioglossa (Pfr.), kidney long, genital organs simple, jaw ribbed ; Semper, Reis. Arch. Philippin. iii. p. 163. *H. (P.) troostiana* (Lea), radula, jaw, and genital organs ; Binney, Ann. Lyc. N. York, xi. p. 28, pl. v. figs. 3 & 6. *H. (P.) uvulifera* (Shuttl.), jaw and radula ; Bland & Binney, *op. cit.* x. p. 339. *H. (P.) texana* (Moric.), jaw and radula ; Binney, P. Ac. Philad. 1874, p. 50, pl. viii. fig. 1.

H. (Stenotrema) edwardsi (Bland), jaw and radula ; Binney, *l. c.* p. 49. *H. (Triodopsis) obstricta* (Say), genital organs ; *id. Ann. Lyc. N. York*, xi. p. 28. *H. (T.) appressa* (Say), genital organs ; *id. P. Ac. Philad.* 1874, p. 40, pl. iv. fig. 4. *H. (T.) clausa* (Say), jaw and radula ; *id. l. c.* p. 49 ; genital organs, *id. Ann. Lyc. N. York*, xi. p. 29, pl. v. fig. 4.

H. (Mesodon) albilabris and *thyreoides* (Say), kidney long, genital organs simple, jaw ribbed, lateral teeth nearly subulate ; Semper, Reis. Arch. Philippin. iii. p. 162. *H. (M.) wheatleyi* (Bland) and *clarki* (Lea), jaw, radula, and genital organs ; Binney, Ann. Lyc. N. York, xi. pp. 28 & 29, of the first, figured pl. vi. figs. 1 & 6. *H. (M.) pennsylvanica* (Green),

genital organs; *id. l. c. p. 29, pl. v. fig. 7. H. (M.) mitchellana* (Lea) and *ræmeri* (Pfr.), genital organs; *id. P. Ac. Philad. 1874, p. 40, pls. iii. fig. 3, iv. fig. 5. H. (M.) downseana* (Bland), jaw and radula; *id. l. c. p. 49. H. (M.) wetherbyi*, sp. n., Bland, Ann. Lyc. N. York, x. p. 361, Laurel River, Kentucky; its jaw and radula, Binney, P. Ac. Philad. 1874, p. 79. *H. (M.) mobiliana* (Lea), distinct from *jejuna* (Say); Bland, Ann. Lyc. N. York, x. p. 363.

Helix, groups *Arionta* and *Lysinoe*. J. G. Cooper, P. Cal. Ac. v. pp. 121-124, discusses the geographical distribution of the Californian species, reducing to two those of the first group, viz., *californiensis* (Lea) and *kelletti* (Forbes). Both are very variable, becoming more elevated and imperforate in cold, foggy localities (*H. vincta* and *memorivaga* being such varieties of the former, and *H. tryoni* and *redimita* of the latter), and more depressed and perforate in warmer localities (*H. ramentosa*, *reticulata*, and *bridgesi* being such varieties of the first named, and *H. crebristriata*, *intercisa*, and *stearnsiana* of the last species). Of the group *Lysinoe*, he regards *ayresana* (Newc.), *dupetitthouarsi* (Val.), *fidelis* (Gray), *mormonum* (Pfr.), *remondii* (Tryon), *traski* (Newc.), and *rowelli* (Newc.) as best entitled to specific rank.

Helix (Arionta) stearnsiana (Gabb), jaw, radula, and genital organs; Binney, Ann. Lyc. N. York, xi. p. 39, pl. vi. fig. 2. *H. (A.) traski* (Newc.), *kelletti* (Forbes), *nickliniana* (Lea), and *reticulata* (Pfr.), genital organs; *id. l. c. p. 30, pl. vi. fig. 4*, and P. Ac. Philad. 1874, pp. 39-41, pls. iii. figs. 4 & 2, iv. fig. 2.

Helix. Species from Central and Southern America:—

H. (Fruticicola?) griseola (Pfr.), radula; Binney, P. Ac. Philad. 1874, p. 55, pl. x. fig. 11.

H. (Leptoloma) fuscocincta (C. B. Ad.), radula; *id. l. c. p. 58, pl. ix. fig. 11*.

H. platystyla (Pfr.) is from Jamaica; Bland, Ann. Lyc. N. York, xi. p. 82.

H. (Coryda) gossii (Pfr.), radula; Binney, *l. c. p. 55, pl. ix. fig. 2*.

H. (Cysticopsis) tumida (Pfr.), radula; *id. l. c. p. 56, pl. ix. fig. 1*.

H. (Plagiptycha) sargenti, sp. n., Bland, Ann. Lyc. N. York, xi. p. 79, Little Inagua, Bahama. *H. macroglossa* (Pfr.), radula; Binney, *l. c. p. 56, pl. x. fig. 10*.

Helix, sub-genus *Polymita* (Beck), is characterized by the teeth of the radula being arranged "en chevron," long, subquadrangular, and not reflected along its upper margin as usual in the *Helicidae*, but bearing the gouge-shaped expanded cutting edge soldered, as it were, upon its surface; also by the arched, smooth jaw, without median projection. *H. picta* (Born) and *muscarum* (Lea), probably also *sulphurea* (Morelet) and *versicolor* (Born). Bland & Binney, Ann. Lyc. N. York, x. pp. 341 & 342, pl. xvi. figs. 1 & 2, and P. Ac. Philad. 1874, p. 56.

Helix, sub-genus *Hemitrochus* (Swains.), will comprise the rest of the West Indian species referred to *Polymita*, which have the usual dentition of the *Helicidae*, as ascertained in *H. varians* (Mke.), *trosccheli* (Pfr.), *gallopavonis* (Val.), *graminicola* (C. B. Ad.), and *rufopapicata* [!] (Poey). *Iid.*

l. c. pp. 342 & 343; Binney, *op. cit.* xi. p. 26, pl. v. fig. 5, and P. Ac. Philad. 1874, p. 56, pl. x. fig. 8.

H. (Thelidomus) discolor (Fér.), jaw and radula: Binney, P. Ac. Philad. 1874, p. 51, pl. x. fig. 1; genital organs, *id.* Ann. Lyc. N. York, xi. p. 27, pl. ii. fig. ix. *H. (T.) notabilis* (Shuttl.), *lima* (Fér.), and *provisoria* (Pfr.), jaw and radula; *id.* P. Ac. Philad. 1874, pp. 50 & 56, pl. ix. fig. 10; Bland & Binney, Ann. Lyc. N. York, x. p. 347.

H. (Eurycratera) angulata (Fér.), jaw and radula; Binney, P. Ac. Philad. 1874, p. 50, pl. ix. fig. 5. *H. (E.) crispata* (Fér.), radula; *id. l. c.* p. 56, pl. x. fig. 9.

H. (Polydotes) luquillensis (Shuttl.), radula; *id. l. c.* p. 50, pl. x. figs. 2-4.

H. (Dentellaria) badia (Fér.), *nux-denticulata* (Chemn.), *nucleola* (Rang) and *josephinae* (Fér.), jaw, radula, and genital organs; *id. l. c.* pp. 52 & 57, pl. ix. fig. 8, and Ann. Lyc. N. York, xi. pp. 26 & 27, pls. ii. fig. 6, v. figs. 8 & 9. *H. (D.) formosa* (Fér.), jaw and radula; *id. l. c.* p. 52. Notes on the occurrence and colours of the living animals in several species by Mazé, J. de Conch. xxii. pp. 159-162.

[*Cepolis*?] *Helix macneili* (Crosse); Crosse, J. de Conch. xxii. p. 71, pl. ii. fig. 3, Nicaragua.

Pleurodonta invalida (Ad.), jaw with 2 ribs; a short flagellum. Semper, Reis. Arch. Philipp. iii. p. 16. *Helix (Pl.) chemnitziana* (Pfr.) and *carmelita* (Fér.), jaw with about 6 ribs; Binney, *l. c.* pp. 51 & 58.

[*Labyrinthus*] *Helix erecta* (Mouss.); Pfeiffer, Novitat. Conch. iv. pl. cxxvii. figs. 1-3.

[*Isomeria*] *H. subelliptica* and *basidens* (Mouss.); *id. l. c.* figs. 4-6, & 7-9.

Helix (Caracolus) marginella (Gmel.), jaw and radula; Binney, *l. c.* p. 51. *H. (C.) excellens* (Pfr.), radula; *id. l. c.* p. 58, pl. x. figs. 6 & 7. *H. (C.) marginella*, peculiar to Portorico, and *bizonalis* (Desh.) to Hayti; Bland, Ann. Lyc. N. York, xi. pp. 80 & 81. *H. bermudensis*, see above, p. 157.

H. cuyana (Strobel); Strobel, Malac. Argent. p. 11, Angostura, Argentine States.

Cochlostyla (Fér., Mart.). Form of the shell very variable; kidney long, ribbon-shaped; a globose or ovate accessory gland instead of the multifid vesicles: dart simple, stiletto-shaped; no flagellum. In some species, a small cervical lobe of the mantle. The groups *Azina* and *Corasia* are to be united with this genus, as proposed by Dohrn and the Recorder, but *Chloræa* is nearer *Fruticicola*. Semper, Reis. Arch. Philippin. iii. pp. 164-168. *C. cineracea*, *flammulata*, *turris*, *montana*, *lacerata*, *limasanensis*, *suprabadia*, *erubescens*, and *lividicincta*, spp. nn., figured, but not described; *id. l. c.* pl. ix. figs. 1-9.

Cochlostyla polymorpha, sp. n., Tapparone-Canefri, Malac. viagg. Ma-genta, p. 82, pl. ii. fig. 4, Singapore [= *Bulinus comes*, Pfr.].

Cochlostyla fulgetrum (Brod.), radula; Binney, P. Ac. Philad. 1874, p. 59, pl. v. figs. 14-16.

Amphidromus maculiferus (Sow.), *sinistralis* (Rve.), *contrarius* (Müll.), *interruptus* (Müll.), and *atricollosus* (Gould), anatomically examined: kidney, flagellum, and stalk of the bursa copulatrix elongate; jaw feebly ribbed; rows of the radula oblique. *A. chloris* (Rve.) found only at Zamboanga, *A. maculiferus* (Sow.) in North and East Mindanao, Leyte, and Bohol; Semper, Reis. Arch. Philippin. iii. pp. 146-149, pls. xiv. fig. 1, xvi. figs. 20-22. *Bulimus perversus* (L.): young specimens have a brown spiral band, which is lost in the adult; Martens, in Pfeiffer's Novitat. iv. pl. cxxviii. figs. 11 & 12.

Bulimus. C. Semper, Reis. Arch. Philippin. iii. pp. 149-158, has studied the anatomy of several American and Australian species of different sub-genera, finding in all a very short kidney and very simple genital organs; he classifies them, however, according to the structure of the jaw, in accordance with the Recorder's view [Zool. Rec. ix. pp. 165 & 170], in the following manner:—

Bulimus (emend.): jaw simple, with parallel ribs. Comprises the sub-genera *Borus*, *Dryptus*, *Pachyotus*, *Scutulus*, and *Plectostylus*, all South American.

Bulimulus: jaw consisting of a few plates, the margins of which are slightly convergent, and partially united. Comprises the sub-genera *Mesembrinus* and *Thaumastus*, both South American, and *Liparus*, from Australia.

Otostomus: jaw consisting of numerous narrow plates, the margins of which are very convergent, and sometimes united near the cutting edge. Comprises the sub-genera *Otostomus*, *Pelecychilus*, *Liostracus*, and *Mormus*, all South American, and *Placostylus* and *Charis*, from the Melanesian islands. [For *Bulimulus* and *Otostomus*, see *postea*, pp. 171 & 172.]

W. G. Binney also characterizes *Bulimus* proper by its marginal teeth being of the same type as the laterals; Ann. Lyc. N. York, xi. p. 33.

Bulimus (Borus) oblongus (Müll.), genital organs, kidney, and radula; Semper, l. c. pls. xiv. fig. 10, xvi. fig. 25, xvii. fig. 1. *B. nucleus* (Orb.) from the southern part of the La Plata States; Strobel, Malac. Argent. p. 20.

Bulimus (Dryptus) marmoratus (Dkr.), radula, Binney, P. Ac. Philad. 1874, p. 59, pl. vi. fig. 2; *pardalis* (Fér.), jaw ribbed, *id. ibid.*; *loveni* (Pfr.) and *blainvillianus* (Pfr.), genital organs, Semper, l. c. pl. xv. fig. 1, radula, pl. xvii. figs. 3 & 4.

Bulimus (Eurytus) ampullaroides and *subglandiformis* (Mouss.); Pfeiffer, Novitat. Conch. iv. pls. cxxix. figs. 1 & 2, cxxx. figs. 1 & 2.

Bulimus (Orphnus) foveolatus (Reeve) and *hanleyi* (Pfr.), jaw and radula; Binney, Ann. Lyc. N. York, xi. p. 39, pl. i. fig. 3, and P. Ac. Philad. 1874, p. 59, pl. vi. fig. 5.

Bulimus (Pachyotus) egregius (Jay), radula; Binney, P. Ac. Philad. 1874, pp. 54 & 58, pl. vi. fig. 1. The same species and *bilabiatus* (Brod.) examined by Semper, l. c. p. 151. *B. (P.) wallisianus* (Mouss.); Pfeiffer, Novitat. iv. pl. cxxx. figs. 7 & 8.

Bulimus (Pelecychilus); see *postea*, p. 171.]

Bulimus (Anthinus) multicolor (Rang), and (*Macrodontes*) *odontosto-*

mus (Sow.), jaw without ribs, radula described; Binney, P. Ac. Philad. 1874, p. 58, pl. vi. figs. 8 & 7.

Bulimus (*Odontostomus*) *dædaleus* (Desh.) var. *major*, and *dentatus* (Wood) var. *patagonicus* (Orb.); Strobel, Malac. Argent. pp. 16-20, States of La Plata.

Bulimus (*Plectostylus*) *chilensis* (Less.), genital organs; Semper, l. c. pl. xv. fig. 6, radula, pl. xvii. fig. 12.

Bulimus (*Leptomerus*) *sepulchralis* (Poey), jaw odontognath, and radula; Binney & Bland, Ann. Lyc. N. York, x. p. 347.

Bulimus siamensis (Pfr.). A small cervical lobe to the mantle; kidney long, genitals simple, a short flagellum; jaw ribbed. Semper, l. c. p. 164; radula, pl. xvii. fig. 23.

Limicolaria rueppelliana (Pfr.), Abyssinia, *L. adansoni* (Pfr.) = *kambeul* (Adanson, Brug.) = *turris* (Pfr.), W. Africa and the upper regions of the White Nile, *L. flammea* (Müll.) = *striatula* (Müll.) = *aurora* (Jay) = *sennariensis* (Parr.) = *cailliaudi* (Pfr.) = *suffusa* and *numidica* (Reeve) = *beccarii* (Morelet), very variable in form, W. Africa and upper regions of the Nile, down to Sennaar, *L. heuglini* (Martens), S. Abyssinia and Bahr-el-ghasal. Jickeli, Verh. L. C. Ak. xxxvii. pp. 152-165, pl. vi. figs. 2, 3 & 4, 5-9, & 10; jaw and radula of the last, pp. 166 & 167, pl. ii. fig. 8.

Achatina granulata (Pfr.), *fulica* (Fér.), *marginata* (Swains.), *zebra* (Chemn.), *Limicolaria turbinata* (Rve.), and *Perideris alabaster* (Rang), anatomically examined. They agree in several particulars; for example, an annular muscle round the sheath of the penis, the long, ribbon-shaped kidney, the rudimentary median tooth of the radula, the presence of one or two lobes on the edge of the mantle, and the flat hinder end of the foot, without mucous gland; the jaw is ribbed in the true *Achatinæ*, striated only in the above species of *Limicolaria* and *Perideris*. C. Semper, Reis. Arch. Philippin. iii. pp. 142-146, pls. xii. figs. 1 & 2, 17, & 23, xvi. figs. 14 & 15.

Achatina vignoniana, sp. n., Morelet, J. de Conch. xxii. p. 372, Gaboon. [There is already an *A. vignoni*, Morelet, J. de Conch. 1860.]

Achatina schweinfurthi (Martens) figured by Jickeli, Verh. L. C. Ak. xxxvii. p. 150, pl. vi. fig. 1, Niam-Niam territory.

Achatina dohrniana (Pfr.), distinct from *A. welwitschi* (Morelet); Morelet, J. de Conch. xxii. pp. 60-62.

Buliminus eremita (Bens.) var., valley of the Sarafschan, *sogdianus*, sp. n., high mountains of the same place, *albiplicatus*, sp. n., Taschkent, *segregatus* (Bens.) var. *minor*, Schachimardan, and *miser*, sp. n., Autshi, Martens, in Fedchenko's Turkest. Moll. pp. 18-21, pl. ii. figs. 13-17.

Buliminus (Pfr.) *fasciolatus* (Olivier), Syria and Upper Mesopotamia, from Alexandretta and Merssina, Mousson, J. de Conch. xxii. p. 13, and Martens, Vorderas. Conch. pp. 20 & 21, p. iv. fig. 24. *B. eburneus* (Pfr.), and *hebraicus* (Pfr.), Mousson, l. c. pp. 12 & 13; the latter = *fasciolatus* var., Martens, l. c. p. 123. *B. hohenackeri* (Kryn.), Transcaucasia, and *tauricus* (Lang), western extremity of the Caucasus, Martens, l. c. pp. 20 & 22.

Buliminus (*Petræus*) *mesopotamicus*, sp. n., Martens, l. c. p. 22, pl. iv.

fig. 25, Mardin, Mesopotamia; *carduchus*, sp. n. *id. l. c.* p. 23, pl. iv. fig. 26, Kurdistan; *kotchii* (Pfr.), from Orfa, *id. l. c.* p. 24, pl. iv. fig. 30; *halepensis* (Fér.) and *labrosus* (Ol.), *id. l. c.* p. 23.

Buliminus (*Petræus*) *abyssinicus* (Rüpp.) = *harrisi* (Reeve), shell, jaw, and radula; Jickeli, Verh. L. C. Ak. xxxvii. pp. 103-105, pls. ii. fig. 2, v. fig. 2. *B. (P.) hemprichi*, sp. n., *id. l. c.* p. 106, pl. v. fig. 3, Mensa, N. E. Africa.

[*Buliminus*] *Bulimus densus* (Pfr.), *pusillus* and *scrobiculatus* (Blanf.), *proletarius* (Pfr.), *trutta* (Blanf.), *lepidus* (Gould), *plicifer* (Blanf.), and *putus* (Bens.), figured; Hanley & Theobald, Conchol. Ind. pls. lxxix. figs. 6, 8, & 9, lxxx. figs. 3, 4, 6, 8, & 9.

[*Buliminus*] *Bulimus bourguignati*, sp. n., Letourneux, Cabylie, i. p. 225, Cabylia.

Buliminus insularis (Ehrenberg, 1831, as *Pupa*) = *Pupa pulla* (Gray, 1834) = *Bulimus agrensis* (Kurr) = *B. contiguus* (Reeve) = *teres* (Pfr.) = *chion* (Pfr.), East Indies and shores of the Red Sea, to 2815 feet above the sea; Jickeli, Verh. L. C. Ak. xxxvii. pp. 108 & 109.

Buliminus samavaensis, sp. n., Mousson, J. de Conch. xxii. p. 38, Samava, Lower Mesopotamia [see the following species].

Buliminus (*Napæus*) *fallax* (Say) = *cenopictus* (Hutton) = *Pupa pacifica* (Pfr.) = *Pupa putilla* (Shuttl.) = *Bulimus lardeus* (Pfr.) = *Pupa parraiana* (Orb.) = *P. senegalensis* (Morelet) = *P. sennariensis* (Pfr.) = *Bulimus samavaensis* (Mouss.) = *B. cerealis* and *vermiformis* (Pala-dilhe), widely distributed over North America and the West Indies, western and north-eastern Africa, Mesopotamia, India, Australia, and Sir Charles Hardy Island in the Pacific; Jickeli, Verh. L. C. Ak. xxxvii. pp. 97-102, pl. v. fig. 1, jaw and radula, pl. ii. fig. 1, [Cf. Zool. Rec. x. p. 166.] The same species, under the name *Bulimus pacificus* (Pfr.), from Pigeon Island, N. W. Australia, figured by E. Smith, Moll. Voy. Ereb. & Terr. pl. iv. fig. 6. Jaw and radula also by Bland & Binney, Ann. Lyc. N. York, x. p. 348.

Buliminus (*Chondrula*) *intumescens*, sp. n., Martens, in Fedchenko's Turkest. Moll. p. 22, pl. ii. fig. 18, Samarcand; *anatolicus* (Issel) and *ghilanensis* (Issel) from Persia, *id. Vorderasiat. Conch.* pp. 25 & 26, pl. iv. figs. 31 & 32; *tridens* (Müll.) var. *bayeri* (Parr.), Caucasus, *id. l. c.* p. 25. *Chondrus arctespira* [!], sp. n., Mousson, J. de Conch. xxii. p. 14, Aleppo; *septemdentatus* (Roth) var. *n. borealis*, Tarsus, *id. ibid.*; on varieties of the same species, Martens, Vorderasiat. Conch. p. 26.

Partula. Genital organs simple; kidney long; jaw consisting of numerous narrow converging plates, partly united (several species examined). Semper, Reis. Arch. Philippin. iii. p. 156; genitals, pls. xii. fig. 21, xvi. fig. 21, jaw, pl. xvii. fig. 18, radula, pl. xvii. fig. 17.

Achatinella. 19 species, belonging to different groups, and from different islands, have been anatomically examined by W. G. Binney; a peculiar character common to them is the division of the albuminous gland into long, wavy, delicate, thread-like cæca. Many of them have been ascertained to be viviparous; the foot is usually broad in front, and rapidly narrowed towards the pointed tail; the lung is perfectly black. In jaw and dentition, the species of the sub-genera *Partulina*

(Pfr.) and *Achatinella* (s. str.) agree with each other, and with the description given by Heynemann, Mal. Blätt. 1869; those of *Newcombia* and *Laminella* show, on the contrary, the usual type of the *Helicinae*, but the central tooth is quite narrow; the jaw arcuate, without ribs, and thickest on the cutting edge. The species of the sub-genus *Leptachatina* agree with them in the jaw and central and lateral teeth, but the reflected apex of the marginal tooth is simply bi- or tri- dentate in *Laminella* and *Newcombia*, and bluntly digitate in *Leptachatina*, somewhat as in *Partula*. Bland & Binney, Ann. Lyc. N. York, x. pp. 331-337, pl. xv. figs. 4 & 5, genital system of *Ach. producta* (Reeve); fig. 6, jaw of *Newcombia picta* (Migh.); fig. 7, jaw, figs. 9-11, dentition, of *Laminella mastersi* (Newc.); fig. 2, dentition of *Achatinella producta*; fig. 8, marginal teeth of *Leptachatina nitida* (Newc.). An abstract in J. de Conch. xxii. pp. 135 & 136.

Achatinella kauaiensis (Newc.); Pfeiffer, Novitat. iv. pl. cxxvi. figs. 8-11.

Cionella (*Glessula*) *orophila* (Bens.) viviparous, genital organs, jaw, and radula described; Semper, Reis. Arch. Philippin. iii. p. 133, pls. xii. figs. 14-16, xvi. fig. 18. *C. philippinensis*, sp. n., id. l. c. p. 139, Zamboanga, Philippines. *Glessula montana* (Martens); Jickeli, Verh. L. C. Ak. xxxvii. p. 132, pl. v. fig. 19, Abyssinia. *Achatina* (*Electra*) *serena* (Bens.); Hanley & Theobald, Conch. Ind. pl. lxxviii. fig. 8.

Cionella pfeifferi, sp. n. ?, Weinland, Nachr. mal. Ges. 1874, pp. 36, woodcut, Hohenwittlingen, Wurtemberg. [An unusually large specimen of *C. lubrica*.]

Cionella (*Azeza*) *maroccana*, sp. n., Mousson, JB. mal. Ges. i. p. 94, pl. v. fig. 1, Reraya Valley, Morocco, sub-fossil.

Ferussacia unidentata, sp. n., Jickeli, Verh. L. C. Ak. xxxvii. p. 132, pl. v. fig. 20, Alexandria.

Acicula (*Cæcilianella*) *judaica* (Bourg.), from Merssina, Asia Minor: Mousson, J. de Conch. xxii. p. 15; *minuta*, sp. n., alluvial deposits of the Euphrates, id. l. c. p. 39.

Acicula munzingeri (Jickeli, 1873, as *Stenogyra*), Jickeli, Verh. L. C. Ak. xxxvii. p. 133, jaw and radula, pl. ii. fig. 3, shell, pl. v. fig. 21.

Geostilbia gundlachi (Pfr., as *Achatina*), from Hayti; Crosse, J. de Conch. xxii. p. 88.

Tornatellina manilensis (Dohrn). Some incomplete anatomical notes on it by Semper, l. c. p. 134, pl. xvi. fig. 13; it lives in marshy places, on the trunks of *Rhizophora*, p. 140.

Tornatellina mariæi, sp. n., Crosse, J. de Conch. xxii. pp. 109 & 393, pl. xii. fig. 7, New Caledonia.

Rumina decollata (L.) var. *maura* (Crosse); id. l. c. p. 72, pl. ii. fig. 6, Morocco [= *Bulimus paive*, Lowe, P. L. S. 1860, p. 201].

Stenogyra (*Pseudobalea*) *dominicensis* (Pfr.); jaw striate, teeth of the radula quadrate, tricuspid; viviparous. Bland, Ann. Lyc. N. York, xi. p. 85.

Stenogyra (*Opeas*) *panayensis*, *gracilis*, *juncea*, and (*Subulina*) *octona* (L.), anatomically examined; jaw nearly smooth; viviparous; genital organs near those of *Glessula* and *Achatina*; the so-called *Glandina*

vesiculata (Bens.) and *Homorus inornatus* (Pfr.) are closely allied. Semper, Reis. Arch. Philipp. iii. pp. 134 & 135, pl. xi. figs. 17 & 21. *S. panayensis* (Pfr.), common on many of the Philippines and on the Pelew Islands; *id. l. c.* p. 137, pl. viii. fig. 15. *S. pilosa*, *pagoda*, ? *montana*, ? *arayataensis*, and ? *minuta*, spp. nn., *id. l. c.* pp. 138 & 139, Philippines.

Stenogyra martensi, sp. n., Strobel, Malac. Argent. p. 27, Buenos Ayres.

[*Stenogyra*] *Bulimulus mazei*[-zæi], sp. n., Crosse, J. de Conch. xxii. pp. 118 & 202, pl. iv. fig. 3, Martinique.

Subulina isseli, sp. n., *variabilis*, *subulata*, *angustata*, *suaveolans* [-ens] (Jickeli, 1873, as *Stenogyra*), *antinorii* (Morelet, 1872) = *vernicoxa* (Jickeli, 1873), and *cyanostoma* (Rüpp., as *Achatina*), fully described; Jickeli, Verh. L. C. Ak. xxxvii. pp. 138-149, pl. v. figs. 22-29, jaw and radula of *variabilis*, *subulata*, *antinorii*, and *cyanostoma*, pl. ii. figs. 4-7, all from Abyssinia or neighbouring territories.

Rhodea gigantea (Mouss.); Pfeiffer, Novitat. iv. pl. cxxvii. figs. 10 & 11.

Megaspira (Lea). The two known species figured in Reeve's Conchologia Iconica, parts 316 & 317.

Clausilia: the species of the sub-genus *Clausiliastra* systematically arranged by O. v. Möllendorff, Nachr. mal. Ges. 1874, pp. 60-62.

Clausilia rossmässleri var. *lorinae* (Gredl.) distinguished from *stenzi* (Rossm.) var. *funki* (Küst.); *id. l. c.* pp. 77-81.

Clausilia plicata (Drap.): several varieties, *C. æmula* (Westerl.) = *mucida* (Ziegl.), and *C. grimmeri* (Parr.), from Styria, described; Westerlund, Mal. Bl. xxiv. pp. 59 & 60.

Clausilia druiditica and *armoricana* (Bourg.); Desmars, Cat. Moll. Ile et Vilaine, p. 42, Brittany.

Clausilia dysatherata, sp. n., Jickeli, l. c. p. 129, pl. vi. fig. 18, Habab, nearly allied to *sennaarensis* (Pfr.), the description of which is corrected, p. 128.

Clausilia (*Phædusa*) *chinensis*, sp. n., Möllendorff, JB. mal. Ges. i. p. 79, Kiukiang, Kiangsi, China.

Pupa dupuyi, sp. n., St. Sauveur, Pyrenees, and *calpica* (Westerlund, 1872), Westerlund, Mal. Bl. xxiv. p. 58, pl. ii. figs. 5 & 7, 6 & 8. *P. hoppii* (Möller), distinct from *arctica* (Wallenberg), *id. l. c.* p. 57. *P. bigorrensis* (Charp.), *megachilus* (Jan), *goniostoma* (Küst.), *arignonis* (Rossm.), *moquiniana* (Küst.), *pyrenearia* (Mich.), *vergnesiana* (Charp.), *clausilioides* (Boubée), and *ringens* (Mich.) described, *id. l. c.* pp. 61-66.

Pupa (*Pupilla*) *cristata*, sp. n., Martens, in Fedchenko's Turkestan Moll. p. 23, pl. ii. fig. 19 (shell), pl. iii. fig. 40 (radula), Samarcand.

Pupa brugnieri, sp. n., from southern Abyssinia, very near *umbilicata* (Drap.), but distinct by having 2 instead of 3 plaits in the aperture of the freshly formed shell; Jickeli, Verh. L. C. Ak. xxxvii. pp. 112-114, pl. v. figs. 5 & 6. *P. imbricata*, *klunzingeri*, *pleimesi*, *bisulcata* (Jickeli, 1873), *reinhardti*, *lardea*, *schilleri*, and *blanfordi*, spp. nn., *fontana* (Krauss), and *abyssinica* (Reinhardt), all from Abyssinia, fully described; *id. l. c.* pp. 115-127, pl. v. figs. 7-17. *P. hagenmacheri*, p. 118, and *similis*, p. 296, pl. v. fig. 16, spp. nn., *id. l. c.* Habab.

Pupa isserica and *kabyliana*, spp. nn., Letourneux, Cabylie, i. p. 226, Cabylie.

Pupa (Sphyradium) scyphus (Friv.) var. n. *mesopotamica*, Mousson, J. de Conch. xxii. p. 31, Mesopotamia.

Pupa orientalis (Parr.), Martens, Vorderas. Conch. p. 28, pl. iv. fig. 33, Aleppo; var. *mesopotamica* (Mouss.), *id. l. c.* fig. 34; var. *nitida*, Mousson, *l. c.* p. 31.

Pupa bathydon (Bens.), *salwiniana* (Theob.), and *lapidaria* (Hutt.), figured; Hanley and Theobald, Conchol. Ind. pl. c. figs. 7, 9, & 10.

Pupa desmazuresi and *lienardi* (Crosse, 1873), Crosse, J. de Conch. xxii. pp. 227 & 228, pl. viii. figs. 3 & 4, Rodriguez Island; *P. paitensis* and *fabreana* (Crosse, 1872), fully described; *id. l. c.* pp. 391 & 392, pl. xii. figs. 5 & 6, New Caledonia.

Pupa strangei (Pfr.), and sp. n. ?, from Australia, E. Smith, Moll. Voy. Ereb. & Terr. p. 3, pl. iv. figs. 8 & 7.

Pupa (Leucochila) rupicola (Say), jaw and dentition; Binney, P. Ac. Philad. 1874, p. 52.

Pupa (Vertigo) macdonnelli and *scotti*, spp. nn., Brazier, P. Z. S. 1874, p. 669, pl. lxxxiii. figs. 22 & 23, 24-26, Fitzroy Island, N. E. Australia.

Strophia decumana (Fér.) and *mumia* (Brug.) var. ?, jaw and dentition, Bland & Binney, Ann. Lyc. N. York, x. p. 348, and P. Ac. Philad. 1874, pl. viii. fig. 1; *iostoma* (Pfr.), jaw and dentition, Binney, *op. cit.* xi. p. 31, pl. ii. fig. 8; notes on shell of this and *calcareia* (Pfr.), Bland, *tom. cit.* p. 85.

Eucalodium decurtatum (H. Adams), *recticosta* (Pfr.), and, as anomalous species, *hyalinum* (Pfr.) and *liebmanni* (Pfr.), from Mexico and Central America, described by Crosse & Fischer, Moll. terr. et fluv. Méx. pp. 386-392, pls. xiv. & xv.

GONIOGNATHA (ORTHALICIDÆ).

Helix (Punctum) cryophila (Martens), jaw composed of several plates, radula as in *Helix*; Jickeli, Verh. L. C. Ak. xxxvii. pp. 54 & 55, pls. i. fig. 4, iv. fig. 17. *H. (Punctum?) brocchii*, new name for *cryophila* (Morelet, *nec* Martens), and *brucei*, sp. n., *id. l. c.* pp. 56 & 57, pl. iv. figs. 18 & 19, all from Abyssinia.

Helix turbiniformis (Pfr.), goniognath jaw; Binney, Ann. Lyc. N. York, x. p. 79, pl. ii. fig. 2, and P. Ac. Philad. 1874, p. 55, pl. ix. fig. 7.

Orthalicus (Beck). Generic characters discussed. *O. zebra* (Müll.) = *undatus* (Brug.), *longus* (Pfr.), *boucardi* (Pfr.), *livens* (Beck), *princeps* (Beck), and *leucochilus*, sp. n., described and figured by Crosse & Fischer, Moll. terr. et fluv. Méx. pp. 425-459, pl. xviii. Mexico. *O. undatus* is the sole land shell on Socorro, an island on the coast of Mexico; P. Bost. Soc. xiv. p. 303.

Orthalicus obductus (Shuttl.), *gallina-sultana* (Chemn.), and *undatus* (Brug.); jaw, dentition, and genital system examined by Binney, Ann. Lyc. N. York, xi. pp. 37-41, pls. iv. figs. A-C, E, F, vi. fig. 3; the multifid vesicle is wanting in the two latter species.

[*Orthalicus*] *Bulimus dennisoni* (Rv.) var.; Pfeiffer, Novitat. iv. pl. cxxvii. figs. 12 & 13.

Orthalicinus, sub-g. n. of *Orthalicus*, for *Achatina fasciata* (Müll.); Crosse & Fischer, Moll. terr. et fluv. Méx. p. 457.

Liguus virgineus (L.), radula and genital system described by Binney, Ann. Lyc. N. York, xi. pp. 41 & 42, pl. iii.; the genital system agrees with that of *L. fasciatus* (Müll.), but the dentition is nearer that of *Orthalicus*.

Ostotomus and *Bulimulus*. For characters as given by Semper, see above, p. 165.

Ostotomus auris-leporis (Fér.), genital organs; Semper, Reis. Arch. Philippin. iii. pl. xv. fig. 11, radula, pl. xvii. fig. 12, jaw, pl. xvii. fig. 19.

Ostotomus (Pelecychilus) distortus (Brug.), genital organs and radula, Semper, l. c. pls. xv. fig. 3, xvii. fig. 2; *glaber* (Gmel.), radula, Binney, P. Ac. Philad. 1874, p. 58, pl. vi. fig. 6, and Ann. Lyc. N. York, xi. p. 33; *auris-sileni* (Born), jaw and radula, *id.* Ann. Lyc. N. York, x. p. 222, and P. Ac. Philad. 1874, p. 58, pl. vi. fig. 4, genital organs, *id.* Ann. Lyc. N. York, xi. p. 33, pl. iv. fig. 5.

Ostotomus (Drymæus): *Bulimulus vincentinus* and *knorri* (Pfr.), jaw, Binney, P. Ac. Philad. 1874, p. 53; *stramineus* (Guilding) from St. Vincent, and *liliaceus* (Fér.) var. from St. Domingo, Bland, Ann. Lyc. N. York, x. p. 84.

Ostotomus (Drymæus): *Bulimus elegantissimus*, *trivittatus*, and *eversus* (Mouss.), Pfeiffer, Novitat. iv. pls. cxxix. figs. 3 & 4, cxxx. figs. 3-6, 9 & 10, New Granada.

Ostotomus (Liostracus) vittatus (Spix), genital organs; Semper, l. c. pl. xv. fig. 15 [probably = *virginialis* (Pfr.)].

Ostotomus (Mormus) papyraceus (Mawe), radula; *id.* l. c. pl. xvii. fig. 7. *Bulimulus apodemetes* (Orb.), Strobel, Malac. Argent. p. 26, San Luis, Argentine States. *R. (Eudiotus) mendozanus*, sp. n., *id.* l. c. p. 23, Sierra de Mendoza, Argentine States [probably belongs to *Mormus*, certainly not to *Eudiotus*].

Bulimulus (Mesembrinus) virgatus (Fér.), genital organs; Semper, l. c. pl. xv. fig. 4, radula, pl. xvii. fig. 6; *altoperuvianus* and *lobbi* (Reeve), jaw, radula, and genital organs, Binney, Ann. Lyc. N. York, xi. pp. 34 & 35, pl. i. figs. 1, 2, 4 & 6; *primularis* (Reeve), radula, *id.* l. c. p. 37, pl. i. fig. 7; *semifasciatus* (Mouss.), Pfeiffer, Novitat. iv. pl. cxxix. figs. 5 & 6 [near *humboldti*, Rve.]; *cordillerae*, sp. n., Strobel, Malac. Argent. p. 22, Sierra de Mendoza.

Bulimulus (Thaumastus) guadelupensis (Brug.), radula, Semper, l. c. pl. xvii. fig. 14; *sporadicus* (Orb.) var. n. *bonariensis*, Strobel, l. c. p. 24, Buenos Ayres.

Bulimus (Scutalus) proteus (Brod.), genital organs, jaw, and radula, Binney, Ann. Lyc. N. York, xi. p. 37, and Semper, l. c. p. 152; *rhodolarynx* (Reeve), radula, Binney, Ann. Lyc. N. York, xi. p. 36, pl. i. fig. 5; *proteiformis* (Dohrn), genital organs and radula, Semper, l. c. p. 152, pls. xv. fig. 7, xvii. fig. 5. Semper places this sub-genus in *Bulimus (Helicidae)*, but the description of the jaws given by Binney shows its place among the *Goniognatha*.

Bulimulus cuernavicensis, sp. n., Crosse & Fischer, J. de Conch. xxii. p. 283, Mexico.

Bulimulus chrysalis (Pfr.), jaw (goniognath, but with an accessory plate, resembling that of *Saccinea*) and radula described by Binney, P. Ac. Philad. 1874, p. 53, pl. v. figs. 11-13; *laticinctus* (Guppy) and *bahamensis* (Pfr.), radula, Bland & Binney, Ann. Lyc. N. York, x. pp. 81. & 82, pl. ii. figs. 1 & 3-5.

Bulimulus (*Leptomerus*), see HELICIDÆ.

Bulimulus (*Liparus*) *melo* (Q. & G.), genital organs and radula; Semper, l. c. pls. xv. fig. 14, xvii. fig. 13. *Bulimus antipodum* (Gray), E. Smith, Moll. Voy. Ereb. & Terr. pl. i. fig. 5 [from a young specimen ?].

Bulimulus (*Plectostylus*) *peruvianus* (Brug.), jaw and radula, Binney, P. Ac. Philad. 1874, p. 53, pl. v. fig. 2; genital organs, *id.* Ann. Lyc. N. York, xi. p. 35, pl. i. fig. 8. Binney and Semper do not agree as to this sub-genus, the latter, from his observations on the nearly allied *B. chilensis* (Less.), genital organs, l. c. pl. xv. fig. 6, radula, pl. xvii. fig. 12, places that species in *Bulimulus* (*Helicidæ*).

(*Bulimulus*) *Eurytus aulacostylus* (Pfr.), jaw as in *Bulimulus*, *Cylindrella*, &c., radula figured; Binney, Ann. Lyc. N. York, x. p. 282, and P. Ac. Philad. 1874, p. 59, pl. vi. fig. 2.

Placostylus (Beck). According to Semper, Reis. Arch. Philippin. iii. the sub-genera *Placostylus* and *Charis* of the old genus *Bulimus* belong to the *Goniognatha*, their jaw agreeing with that of *Ostomus*; he has examined *P. elobatus* (Gould), genital organs, l. c. pl. xv. fig. 5, radula, pl. xvii. fig. 8, *seemanni* (Dohrn), radula, pl. xvii. fig. 9, and (*Charis*) *fulguratus* (Jay), radula, pl. xvii. fig. 10.

[*Placostylus*] *Bulimus alexander* (Crosse) var. *leucostoma*, *B. porphyrostomus* (Pfr.) var. *candida*, and *B. ouveanus* (Dotzauer) var. *alba*, Crosse, J. de Conch. xxii. pp. 108, 109, 182-185; *B. pancheri* var. *candida*, *id.* l. c. p. 102, pl. ii. fig. 3: all from New Caledonia. *P. strangei* (Pfr.), Tapparone-Canefri, Moll. viagg. Magenta, p. 86, pl. ii. fig. 11.

Macroceramus swifti, Bahamas, and *klatteanus*, Hayti, spp. nn., Bland, Ann. Lyc. N. York, xi. pp. 83 & 84.

Macroceramus concisus (Morelet) = *polystreptus* (Tristram), Crosse & Fischer, Moll. terr. et fluv. Méx. p. 421, pl. xviii. fig. 1.

Cylindrella. 10 species from Mexico and Central America fully described and exactly figured, including *swiftiana* (Crosse), *morini* and *subtilis* (Morelet); *id.* l. c. pp. 405-415, pl. xvii.

Cylindrella sanguinea and *brevis* (Pfr.), genital system; Binney, Ann. Lyc. N. York, xi. p. 34, pl. ii. figs. 7 & 3.

Cylindrella gracilicollis (Fér.) is from Hayti, and has two revolving lamellæ inside; Bland, *tom. cit.* p. 82.

Amphibulima patula (Brug.) and *rubescens* (Desh., as *Succinea*), jaw, radula, and genital organs; Binney, P. Ac. Philad. 1874, pp. 44-47, pls. vii. & viii., and Ann. Lyc. N. York, x. pp. 344 & 345; P. Fischer, J. de Conch. xxii. pp. 141-148, pls. v. figs. 8-13, vi. figs. 1-7. The former remarks slight variations in the dentition between individuals from Guadeloupe and St. Kitts and Dominica; the latter (figs. 8, 12, 13) main-

tains the name *Rhodonyx* [Zool. Rec. x. p. 169] for *rubescens*, as a distinct sub-genus, on account of the form of the shell.

Pellicula appendiculata (Pfr., as *Succinea*) is placed by Bland & Binney in *Amphibulima*, on account of the jaw and radula; Ann. Lyc. N. York, x. p. 343, and P. Ac. Philad. 1874, p. 42, pl. viii. fig. 6, genitals, fig. 5. P. Fischer discusses *depressa* (Rang) and *appendiculata* (Pfr.), describing the jaw, radula, nervous system, and genital organs of the former, and placing both in *Amphibulima*, as a distinct sub-genus, *Pellicula*. He remarks that this, in the *Bulimulidæ* [*Orthalicidæ*], is analogous to *Homalonyx* among the *Succineidæ* [*Elastomognatha*], and to *Strebelia* among the *Glandinidæ* [*Agnatha*]. J. de Conch. xxii. pp. 148-155, pl. v. fig. 1-7.

ELASMOGNATHA.

Triboniophorus græffii (Humbert) = *kreffti* and *schuetti* (Keferst.); Heynemann, JB. mal. Ges. i. pp. 195-199, pl. ix. fig. 6, and Tapparone-Canefri, Malac. viagg. Magenta, p. 100.

Succinea obliqua (Say), jaw and dentition; Binney, Not. Amer. Land Shells, ii. p. 43. *S. canella* (Gould), jaw and dentition normal; Bland & Binney, Ann. Lyc. N. York, x. p. 338.

The peculiar parasite of *Succinea*, *Leucochloridium paradoxum* (Carus), and its transformation, fully described by E. Zeller, Z. wiss. Zool. xxiv. pp. 564-578, with a plate; it has also been observed by W. Kobelt, Nachr. mal. Ges. 1874, pp. 52 & 53.

Succinea oblonga var. *sudetica* (Kolenati), Altwater, in the Sudetic Mountains; Reinhardt, Arch. f. Nat. xl. p. 24.

Succinea indica (Pfr.), Alexandria, *rugulosa* (Morelet), Abyssinia, *ægyptiaca* (? Ehrenberg), White Nile, and *striata* (Krauss) var. *limicola* (Morelet), Abyssinia; Jickeli, Verh. L. C. Ak. xxxvii. pp. 167-172, pl. vi. figs. 11-14; jaw and radula of *rugulosa*, p. 169, pl. ii. fig. 9.

Succinea nevillii (Crosse, 1873); Crosse, J. de Conch. xxii. p. 231, pl. viii. fig. 2, Rodriguez Island.

Succinea indica (Pfr.), *semiserica* (Gould), *girnarica* (Theob.), *daucina* (Pfr.), *plicata* (Blanf.), *bensoni* (Pfr.), *baconi* (Pfr.), *vitrea* (Pfr.), *crassiuscula* (Bens.), *acuminata* (Blanf.), and *collina* (Blanf., MS.), figured by Hanley & Theobald, Conch. Ind. pls. lxxvii. & lxxviii.

Succinea calcarea, sp. n., Gassies, J. de Conch. xxii. p. 375, Art Island, New Caledonia.

Succinea meridionalis (Orb.), *luteola* (Gould), and *æquinoctialis* (Orb.) [? = *chiloensis*, Phil.], from the Argentine States; Strobel, Malac. Argent. pp. 27-32.

Succinea (Homalonyx) unguis (Fér.) var. *guadelupensis*, jaw, dentition, and genital organs; P. Fischer, J. de Conch. xxii. pp. 138-140, pl. vi. figs. 7-10.

Homalonyx. To this genus belong, from examination of the radula, the so-called *Amphibulima felina* (Guppy), probably not specifically distinct from *unguis* (Fér.), and *Succinea (Pellicula) convexa* (Martens). Bland & Binney, Ann. Lyc. N. York, x. pp. 346 & 344.

Lithotis rupicola (Blanf.). Jaw arcuate, with vertical striæ and a median projection, no ribs; radula as usual in the *Helicinae* (*Aulacognatha* and *Odontognatha*). *Iid. l. c.* p. 346, and *P. Ac. Philad.* 1874, pl. v. figs. 3-6.

LIMNOPHILA.

Auricula australiana, sp. n., Tapparone-Canefri, *Malac. viagg. Magenta*, p. 105, pl. ii. fig. 10, Australia, very near *A. judæ* (L.).

Auricula pellucens (Menke) from Florida; Bland, *Ann. Lyc. N. York*, xi. p. 87.

Cassidula nucleus (Martyn) = *mustelina* (Desh.), shores of the Red Sea and Indian Ocean, shell, jaw, and radula described; Jickeli, *Verh. L. C. Ak.* xxxvii. pp. 183-185, pl. ii. fig. 10. *C. labrella* (Desh.) = *kraussi* (Küst.) = *lutescens* (Pfr.), same distribution; *id. l. c.* p. 186.

Cassidula pilosa and *truncata*, spp. nn., Gassies, *J. de Conch.* xxii. pp. 209 & 211, New Caledonia.

Plecotrema rapax (Dohrn), shores of the Red Sea; Jickeli, *l. c.* p. 182, pl. vii. fig. 7.

Plecotrema turrita[-tum] and *consobrina*[-num], spp. nn., Garrett, *P. Ac. Philad.* 1873, p. 235, pl. iii. figs. 68 & 69, Viti Islands.

Pedipes subglobosus, sp. n., *id. l. c.* p. 236, pl. iii. fig. 70, Viti Islands.

Alexia setifer[-a] (Cooper) = *myosotis* (Drap.) juv.; Cooper, *P. Cal. Ac.* v. p. 172.

Melampus exesus and *strictus*, spp. nn., Gassies, *J. de Conch.* xxii. pp. 212 & 213, New Caledonia.

Melampus (Tifata) ovuloides, sp. n., Baird, in Brenchley's Cruise of the Curaçoa, p. 442, pl. xxxix. figs. 9 & 10, Samoa Islands.

Melampus massauensis (Ehrenb.) = *erythræus* (Morelet), and *M. siamensis* (Martens, 1865) = *ekrenbergianus* (Morelet, 1872), and a third doubtful species from the shores of the Red Sea; Jickeli, *Verh. L. C. Ak.* xxxvii. pp. 173-177, pl. vii. figs. 1 & 2.

Læmodonta bronii [bronni] (Phil., 1846) = *sandwichiensis* (Souleyet) = *conica* (Pease) = *annaensis* (Mouss.), *oblonga*, sp. n., *amplificata*, sp. n., and *affinis* (Fér., as *Pedipes*), from the shores of the Red Sea; *id. l. c.* pp. 178-182.

Ophicardelus coxianus, sp. n., Tapparone-Canefri, *Malac. viagg. Magenta*, p. 108, pl. i. fig. 12, Sydney.

E. Ray Lankester has published his observations on the embryology of *Limnaea stagnalis* and the early stages of some other Mollusks, in *Q. J. Micr. Sci.* (2) No. lvi. pp. 365-391. Many of this author's views and conclusions are so startling and opposed to what has been hitherto accepted, that further observations are desirable: for example, what has been regarded as the first appearance of the mantle, he declares to be a velum.

Chilina (Gray). Monograph by Sowerby in Reeve's *Conchologia Iconica*, pts. 316 & 317, bringing it up to 18 species, on 3 plates. *C. acuninata*, fig. 6, Valdivia, *patagonica*, fig. 12, Patagonia, *subcylindrica*,

fig. 17, Chili, are apparently new, and *C. elegans* (Fairfield) [Frauenfeld], Valdivia, figured for the first time.

Chilina parchappii, tehuelcha (Orb.) and var. n. *mendozana, puelcha* (Orb.), and *fluminea* (Maton) comparatively described and their variations discussed by Strobel, Malac. Argent. pp. 42-50, Argentine States.

Limnæa truncatula var. n. *wittlingensis*; Weinland, Nachr. mal. Ges. 1874, p. 45, Hohenwittlingen, Wurtemberg (of unusually large size).

Limnæa limosa var. n. *brœcki*, Collin, P.-v. Mal. Belg. 1874, p. xxxiii. Brussels.

Limnæa lagotis (Schrank) varr. nn. *costulata*, Taschkent, and *albopicta*, Durmanköl, Turkestan; Martens, in Fedchenko's Turkest. Moll. pp. 26 & 27, pl. ii. figs. 24 & 23. Var. from Persia, *id.* Vorderasiat. Conch. p. 29, pl. v. fig. 36.

Limnæa abyssicola, sp. n., Brot, Bull. Soc. Vaud. xiii. No. 72, Lake of Geneva, in deep water; its pulmonary cavity contains only water.

Limnæa euphratica, canalifera, and *hordeum*, spp. nn., Mousson, J. de Conch. xxii. pp. 40-42, Samava, Lower Euphrates.

Limnæa obliquata (Martens, 1864) figured in Fedchenko's Turkest. Moll. p. 29, pl. v. fig. 36.

Limnæa natalensis (Krauss) from Abyssinia, jaw and radula; Jickeli, Verh. L. C. xxxvii. pp. 191 & 192, pl. iii. fig. 1.

Limnæa peregra (Drap.) ? and *truncatula* (Müll.) ? from Abyssinia; *id.* l. c. pp. 193 & 194, pl. vii. figs. 9 & 10.

Limnæa chlamys (Bens.), *rufescens* (Desh.), and *pinguis* (Dohrn) figured; Hanley & Theobald, Conch. Ind. pls. lxix. figs. 1-4, 5, 6, lxx. figs. 7 & 10.

Limnæa lambottii, sp. n., Collin, P.-v. Mal. Belg. 1874, p. cvii. Cantagallo, Brazil.

Limnæa viator (Orb.), several varieties; Strobel, Malac. Argent. p. 40, Buenos Ayres, Pampas, and Patagonia.

Erinna newcombi (A. Ad.), jaw and radula resembling those of the *Helicidae*; Bland & Binney, Ann. Lyc. N. York, x. pp. 349 & 350, and P. Ac. Philad. 1874, pl. v. figs. 7-10.

Lantzia (Jousseaume; see Zool. Rec. ix. p. 162) = *Erinna* (H. & A. Adams); Jousseaume, R. Z. (3) ii. p. 25.

Aplexa adamsiana, sp. n., Tapparone-Canefri, Malac. viagg. Magenta, p. 103, pl. iii. fig. 3, Australia.

Physa (Drap.). Monograph by Sowerby in Reeve's Conchologia Iconica, pts. 318 & 319, containing 100 species, on 12 plates. *P. aperta*, fig. 88, *puncturata*, fig. 91, *pinguis*, fig. 93, *attenuata*, fig. 94, *texturata*, fig. 95, *bullata*, fig. 97, *duplicata*, fig. 100, Australia, *eburnea*, fig. 89, *nitida*, fig. 98, Tasmania, *mamillata*, fig. 90, *brunniensis*, fig. 99, Brunni Island, Australia, and *papyracea*, fig. 96, locality unknown: spp. nn.

Physa incisa and *doliolum*, spp. nn., Gassies, J. de Conch. xxii. pp. 378 & 379, New Caledonia.

Physa carltoni, California, and *wolfiana*, Colorado Territory, spp. nn., Lea, J. Ac. Philad. (2) viii. p. 63, pl. xxi. figs. 19 & 20, Observ. Union. xiii. same figs.

Physa taslii (Bourg.) distinguished from *fontinalis* (L.), and *P. sub-*

opaca (Lam.) from *acuta* (Drap.); Desmars, Cat. Moll. Ile & Vilaine, pp. 56 & 57.

Physa acuta (Drap.) = *subopaca* (Lam.) = *nana* and *oblonga* (Potiez & Mich.) = *borbonica* (Fér.) = *canariensis* (Bourg.) = *seychellana* (Martens) = *dalmatina* and *buschi* (Küst.), Southern Europe and several parts of Africa; Jickeli, Ver. L. C. Ak. xxxvii. pp. 206 & 207.

Physopsis abyssinica (Martens), *id. l. c.* p. 210, pl. vii. figs. 15 & 16, notch in the pillar lip distinct only in the young shell.

Isidora (Ehrenb.) distinct by jaw and radula from *Physa*. *I. sericina*, sp. n., *schackoi*, sp. n., *forskali* (Ehrenb.) = *lamellosa* (Roth) = *wahlbergi* (Krauss) = *scalaris* and *schmidtii* (Dunker) = *fischeriana* (Bourg.) = *capillacea*, *clavulata*, *semiplicata*, *turriculata*, and *apiculata* (Morelet) = *beccarii* (Paladilhe), and *I. contorta* (Mich.) = *truncata* (Fér.) = *brocchii* (Ehrenb.) = *hemprichi* (Ehrenb.) = *tropica* (Krauss) = *cyrtolata* (Bourg.) = *scalata* (Merian); shell, jaw, and radula described; *id. l. c.* p. 194 *et seq.*, pls. iii. figs. 2-4, vii. figs. 11-14: the first two from Abyssinia, the last two from Egypt.

Physa (*Isidora*) *lirata*, sp. n., and *brocchii* (Ehrenb.) var. n. *approximans*; Mousson, J. de Conch. xxii. pp. 43 & 42, Lower Mesopotamia.

Planorbis. C. Westerlund, Mal. Bl. xxiv. pp. 70-82, 98-117, pls. ii.-iv., discusses some critical species, and arranges those found in Europe in the following manner:—

- I. *Coretus* (Adans.). *P. corneus* (L.) with varr. *banaticus* (Lang), pl. iii. figs. 4-6, *ammenocerus* (Westerl.), pl. iii. figs. 1-3, *etruscus*, *elophilus*, *adelosius*, *mabillii* (Bourg.), *dufourii* (Graells).

- II. *Tropidiscus* (Stein).

- a, Carinati: *umbilicatus* (Müll.) = *marginatus* (Drap.), with varr. *catinus* (n.) and *subungulatus* (Phil.); *carinatus* (Müll.) with var. *disciformis* (Jeffer.), *nummularis* (Mörch), *turgidus* (Westerl.), *dubius* (Hartm.), *intermedius* (Fér.), and *dilatatus* (Clessin).

- b, Vortices: *vortex*, L., pl. iii. figs. 7-9, with varr. *compressus* (Mich.), figs. 10-12, *discoides* (Reinh.), figs. 13-15, *goesi* (Westerl.), figs. 16-18, *poulsenii* (n.) and *discus* (Parr.), figs. 19-21; *P. vorticulus* (Trosch.), pl. iii. figs. 22-24, with varr. *charteus* (Held), figs. 25-27, and *bavaricus* (n.), figs. 28-30.

- c, Spirorbes: *septemgyratus* (Ziegl.), pl. iii. figs. 31-33, *dazuri* (Mörch) = *spirorbis* (Rossm.), pl. ii. figs. 19-22, *spirorbis* (L., nec Rossm.), pl. iii. figs. 34-36, *rotundatus* (Poiret) = *leucostoma* (Millett) pl. iii. figs. 40-42, with var. *gracilis* (Gredler), figs. 43-45.

- III. *Bathyomphalus* (Ag.): *contortus* (L.), with var. *dispar* (Westerl.).

- IV. *Gyraulus* (Ag., Hartm.): *albus* (Müll.), pl. iv. figs. 1-3, with var. *hispidus* (Drap.), *lemniscatus* (Hartm.), pl. iv. figs. 4-6, *cinctulus*, (Westerl.), *gothicus* (Westerl.), figs. 7-9, *draparnaldi* (Jeffer.), figs. 10-12, *gredleri* (Bielz.), pl. ii. figs. 15-18, *rossmässleri* (Auersw.), *devians* (Porro, 1838) = *deformis* (Hartm., 1844) = *cavatus* (Westerl., 1871), *borealis* (Lovén) = *rossmässleri* (Westerl., 1871, 1873), pl. ii. figs. 23, 25, Norway, Lapland, and Finland,

P. limophilus (Westerl.), pl. iv. figs. 16-18, Sweden, Norway, and Tyrol, *P. crosseanus* (Bourg.), pl. iv. figs. 19-21, France and Tyrol, *P. glaber* (Jeffer., 1830) = *lavis* (Alder, 1830) = *regularis* (Hartm., 1844), pl. iv. figs. 22-24, *P. malmi* (Westerl.).

V. *Armiger* (Hartm.): *crista*, L., var. (a) *cristatus* (Drap.), pl. iv. figs. 25-27, and var. (b) *nautilus* (L.) = *imbricatus* (Drap.), figs. 28-30.

VI. *Hippeutis* (Ag.): *complanatus* (L.) = *fontanus* (Lightf.), pl. iv. figs. 31-33, *riparius* (Westerl.), figs. 34-36, Sweden.

Sub-genus *Segmentina* (Flem.): *P. nitidus* (Müll.), *P. clessini* (Westerl.), pl. ii. figs. 27-30, Sweden and Germany.

Planorbis spinulosus, sp. n., Clessin, CB. Ver. Regensb. xxvii. p. 21, Walchensee, Bavaria.

Planorbis (*Gyraulus*) *intermixtus*, sp. n., and *devians* (Porro) var. n. *euphraticus*, Mousson, J. de Conch. xxii. pp. 45 & 44, Lower Mesopotamia.

Planorbis kabylianus, sp. n., Letourneux, Cabylie, i. p. 229, Cabylie.

Planorbis rueppelli (Dunker), Abyssinia, *pætelii*, sp. n., and *boissii* (Potiez & Mich.) = *alexandrinus* (Roth., nec Ehrenb.), Nile, *abyssinicus*, sp. n., and *costulatus* (Krauss), Abyssinia, Jickeli, Verh. L. C. Ak. xxxvii. pp. 211-219, pl. vii. figs. 17-23. *P. cornu* (Ehrenb.), two varieties from the Nile, p. 218; *P. eques* (Ehrenb.) = *cornu*, juv., p. 298.

Planorbis rodriguezensis (Crosse, 1873), Crosse, J. de Conch. xxii. p. 232, Rodriguez Island.

Planorbis compressus (Hutt.), *rotula* (Bens.), *hyptiocyclus* (Bens.), and *convexusculus* (Hutt.) figured; Hanley & Theobald, Conch. Ind. pl. xcix.

Planorbis kermatoides (Orb.) and *peregrinus* (Orb.), Strobel, Malac. Argent. pp. 33 & 35; *P. pfeifferi* [|| Krauss], sp. n., with var. n. *mendozaanus*, id. l. c. p. 39, Argentine States.

Segmentina angusta, and *alexandrina* (Ehrenb.), Nile, Jickeli, l. c. pp. 220 & 221, pl. vii. figs. 24 & 25; the latter, as in some American species, has internal teeth in the first whorls and none in the last.

Ancylus radiolatus (Küst.) var. n. *orientalis*, Diabekr; Mousson, J. de Conch. xxii. p. 33.

Ancylus compressus and *abyssinicus*, spp. nn., Jickeli, l. c. pp. 223-226, pl. vii. figs. 26 & 27, 28, jaw and radula of the last, pl. iii. figs. 5 & 6, Abyssinia.

Ancylus ceylonicus and *verruca* (Bens.), Hanley & Theobald, Conch. Ind. pl. lxxxi. figs. 1 & 2.

Ancylus concentricus (Orb.) var. *bonariensis*; Strobel, Malac. Arg. pp. 50 & 51, Buenos Ayres.

PULMONATA OPERCULATA.

CYCLOPHORIDÆ.

Cyclotus angulatus, sp. n., Martens, JB. mal. Ges. i. p. 56, Sooloo Islands. *C. flammulatus* (Pfr.) var. from Celebes; Pfeiffer, Novitat. iv. pl. cxxviii. fig. 8.

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Pterocyclus chinensis, sp. n., Möllendorff, JB. mal. Ges. i. p. 78, Kiukiang, Kiangsi, China.

Cyclophorus martensianus, sp. n.; *id. l. c.* p. 78, Kiukiang.

Cyclophorus bellus (Martens); Pfeiffer, Novitat. iv. pl. cxxviii. fig. 10.

Cyclophorus delphinulus (Mousson); *id. l. c.* pl. cxxix. figs. 7-10.

[Buckleya] *Cyclophorus martinezi* and *bifasciatus* (Mousson); *id. ibid.* figs. 11-16.

Cyclophorus (Ditropis) whitii, sp. n., Brazier, P. Z. S. 1874, p. 669, pl. lxxxiii. figs. 5-7, Fitzroy Island, N. E. Australia.

Leptopoma manadense (Pfr.); Pfeiffer, Novitat. iv. pl. cxxviii. fig. 9.

PUPINIDÆ.

Pupina pettardi, sp. n., Crosse, J. de Conch. xxii. p. 370, Cookstown, N. E. Australia.

DIPLOMMATINIDÆ.

Alycæus inflatus and *strigatus*, Assam, *stoliczkii* [-kamus], *globulus*, and *bicrenatus*, Naga Hills, *serratus*, Munipur Hills, *multirugosus* and *graphicus* (Blanf.) var. *minor*, Naga Hills, *burti*, Assam, spp. nn., with notes on the distribution of some other species, Godwin-Austen, J. A. S. B. (n. s.) xliii. pt. 2, pp. 145-150, pl. iii. figs. 1-9. *A. andamania*, *urnula*, *physis*, *hebes*, *gemma*, *armillatus*, *bembez*, *otiphorus*, *plectochilus*, *crenulatus*, and *sculptilis* (Bens.), *ingrami*, *humilis*, *politus*, *nitidus*, *richthofeni*, *avæ*, *graphicus*, *polygonoma*, *succineus*, *vulcani*, *theobaldi*, and *glaber* (Blanf.), and *margarita* (Theobald, MS.), figured by Hanley & Theobald, Conch. Ind. pls. xci.-xcvii.

Alycæus kobeltianus, sp. n., Möllendorff, JB. mal. Ges. i. p. 79, Kiukiang, China.

Diplommata montrouzieri, sp. n., and *perroquini* (Crosse) var.; Crosse, J. de Conch. xxii. pp. 110 & 394, the last, pl. xii. fig. 8, New Caledonia.

Diplommata gowllandi, sp. n., Brazier, P. Z. S. 1874, p. 670, pl. lxxxiii. figs. 19-21, Fitzroy Island, N. E. Australia.

CYCLOSTOMATIDÆ.

Euptychia metableta (Crosse; see Zool. Rec. x. p. 173) fully described; Crosse, J. de Conch. xxii. pp. 77-82, pl. i. fig. 5.

Cyclostoma desmazuresi (Crosse, 1873), *id. l. c.* p. 235, pl. viii. fig. 9; *C. hæmastomum* (Anton) var., *id. l. c.* p. 234, both from Rodriguez Island.

Cyclostoma olivieri (Sow.) from Beirut, Martens, Vorderas. Conch. p. 29, pl. 5, fig. 35. *C. costulatum* (Ziegl.) var. *n. hyrcanum*, southern shore of Caspian Sea, *id. l. c.* p. 30.

Cyclostoma (Leonia) scrobiculata [-tum], sp. n., Mousson, JB. mal. Ges. i. p. 98, pl. v. fig. 2, Morocco.

Choanopoma newcombi, gabbi, and moreletianum (Crosse); Crosse, J. de Conch. xxii. pp. 82-86, pl. iii. figs. 1-3, Hayti.

Choanopoma sumichrasti, sp. n., *id. l. c.* p. 283, Isthmus of Tehuantepec.

Chondropoma occidentale (Pfr.) is from St. Martin's Island, not Martinique; Bland, Ann. Lyc. N. York, xi. p. 85.

Pomatias maresi and *atlanticus*, spp. nn., Letourneux, Cabylie, i. p. 230, Cabylia.

Omphalotropis teniata, littorinula and *hameliana* (Crosse, 1872), from Rodriguez Island; Crosse, J. de Conch. xxii. pp. 237-239, pl. viii. figs. 12, 10, & 11.

TRUNCATELLIDÆ.

Truncatella debilis, sp. n., Mousson, JB. mal. Ges. i. p. 99, pl. v. fig. B, mouth of river Rabat, Morocco.

Truncatella semicostulata, sp. n., Jickeli, Verh. L. C. Ak. xxxvii. p. 189, pl. vii. fig. 8, Dahlak Islands, Red Sea.

ASSIMINEÆ.

Assiminea recta, sp. n., Mousson, JB. mal. Ges. i. p. 100, pl. v. fig. 4, mouth of Rabat river, Morocco. [There is no evidence that this shell belongs to the genus *Assiminea*.]

HELICINIDÆ.

Helicina. Reeve's Conchologia Iconica, parts 310 & 311, contains the close of this genus, bringing it up to 310 species, including *H. novocaledonica* (Baird, MS.), sp. n., fig. 295. [Critical remarks on this monograph concerning the American species; T. Bland, J. de Conch. xxiii. 1875, pp. 245-252.]

Helicina gabbi (Crosse & Newcomb), Crosse, J. de Conch. xxii. p. 87, pl. i. fig. 4, Hayti; *gassiesiana* and *noumeensis*, spp. nn., *id. l. c.* pp. 111, 184-186, pl. iv. figs. 6 & 7, New Caledonia; *reticulata* (Pfr.), E. Smith, Moll. Voy. Ereb. & Terr. pl. iv. fig. 12, Australia; *euglypta*, sp. n., Crosse, *l. c.* pp. 119, 171, & 204, pl. iv. fig. 4; *mazei*, sp. n., *id. l. c.* p. 118, = *antillarum* (Sow.) var., according to Mazé, *tom. cit.* pp. 171 & 203, pl. iv. fig. 5; *fasciata* (Lam.) var. n. *picturata*, Mazé, *l. c.* p. 171 (the last three from Martinique).

Helicina gloyinii, sp. n., Bland, Ann. Lyc. N. York, x. [? 1872] p. 186, Jamaica, 4000 feet above the sea.

Helicina gomeaensis, sp. n., Garrett, P. Ac. Philad. 1873, p. 233, pl. iii. fig. 63, Viti Islands.

Helicina brenchleyi, fulgurata, multistriata, and strigata, Samoa Islands, *julii*, Salomon Islands, and *novæ-caledoniæ*, New Caledonia, spp. nn., Baird, in Brenchley's 'Cruise of the Curaçoa,' p. 448, pl. xli.

Hydrocena rubra, sp. n., Gassies, J. de Conch. xxii. p. 214, New Caledonia.

Hydrocena similis, sp. n., Baird, l. c. p. 440, pl. xxxix. figs. 1 & 2, Samoa Islands.

Georissa multilirata, sp. n., Brazier, P. Z. S. 1874, p. 670, pl. lxxxiii. figs. 8-10, with operculum, Fitzroy Island, N. E. Australia.

SOLENOCONCHÆ.

Dentalium hexagonum (Gould) and *octogonum* (Lam.) from Japan ; Lischke, Jap. Meer. Conch. iii. pp. 74 & 75, pl. v. figs. 4-7, & 1-3.

[*Dentalium*] *Entilis agilis* (G. O. Sars ?) and *striolata* (Stimps.). Animals in various positions ; Verrill, P. Am. Ass. 1873, pl. i. figs. 3 & 4.

Dentalium panormitanum (Chenu), *filum* (G. B. Sow.), dredged on the coast of Sicily, and described by Monterosato, J. de Conch. xxii. p. 256.

Siphonodentalium tetragonum (Brocchi, 1814) = *quinquangulare* (Forbes) ; id. l. c. p. 257.

LAMELLIBRANCHIA.

A list of *Diatomaceæ* found in the stomach of *Mytilus edulis* is given by J. Deby, P.-v. Mal. Belg. 1874, p. ccii. *Diatomaceæ* and spores of *Algæ* found in the stomach of *Ostrea virginiana*, by MacCrady, P. Bost. Soc. xvi. p. 170.

Clessin discusses the fresh-water genera of the Bivalves, wrongly including *Septifer* among them, and omitting *Fischeria* ; MT. Ver. Reich. 1874.

PHOLIDIDÆ.

Pholas davidi, sp. n., Deshayes, Bull. N. Arch. Mus. ix. p. 7, pl. i. fig. 2, Taku, N. China.

Pholididæa tridens (Gray) ; E. Smith, Moll. Voy. Ereb. & Terr. pl. ii. fig. 8, type.

MYIDÆ.

Poromya forbesi, sp. n., H. Adams, P. Z. S. 1874, p. 586, locality unknown. *Poromya* is identical with *Embla* (Lovén), but distinct from *Thetis* (Sow.) and *Eucharis* (Recl.) ; id. *ibid*.

SAXICAVIDÆ.

Saxicava angulata (S. Wood) = *Arcinella carinata* (Philippi), recent in the Mediterranean ; Monterosato, J. de Conch. xxii. p. 255.

Panopea japonica (A. Ad., 1849) = *fragilis* (Gould, 1861), from Yeddo, described ; Lischke, Jap. Meer. Conch. iii. pp. 104 & 105.

ANATINIDÆ.

Anatina japonica (Lischke, 1872), from Yeddo, fully described; *id. l. c.* p. 101, pl. ix. figs. 7-10.

Lyonsia rostrata, sp. n., *id.* JB. mal. Ges. i. p. 58, and *l. c.* p. 102, pl. ix. fig. 13, Southern Japan. *L. navicula* (A. Ad. & Reeve), from Kiusiu; *id. l. c.* p. 103.

Pandora (Brug.). Monograph by Sowerby in Reeve's *Conchologia Iconica*, parts 318 & 319, bringing it up to 23 species (none new), on 3 plates.

SOLENIIDÆ.

Solen (L.). Monograph by Sowerby, *l. c.* parts 312 & 317; 34 species, on 7 plates. *S. jonasi* (Dkr., P. Z. S. 1861) figured for the first time.

Cultellus (Schumacher). Monograph by Sowerby, *l. c.* parts 314-317; 30 species, on 7 plates. *S. subsulcatus*, fig. 18, and *belcheri* (Gray, Brit. Mus.), fig. 19, locality unknown, and *scalpellum*, fig. 25, Red Sea, spp. nn. *S. vitreus* (Boissy), fig. 22, and *ovalis* (Dunker), fig. 24, both from Singapore, figured for the first time.

Solecurtus (Desh.). Monograph by Sowerby, *l. c.* parts 316-319; 39 species, on 8 plates. The following appear to be new:—*seminudus*, fig. 20, *cylindricus*, fig. 23, *rufus* (V. d. Busch?), fig. 27, and *complanatus*, fig. 32, locality unknown, *coquimbensis*, fig. 22, Coquimbo, *violascens* (Desh.), fig. 24, S. W. Mexico, *novaculina* (Bens.), fig. 31, Calcutta, *angulatus*, fig. 37, W. Africa, *peruanus* (Dunker), fig. 38.

Pharus (Leach). 1 species, Reeve's *Conchol. Icon.* parts 316 & 317.

TELLINIDÆ.

Soletellina nitida (Gray); E. Smith, Moll. Voy. Ereb. & Terr. pl. ii. fig. 9.

Soletellina mæsta (Lischke, 1872), from Yeddo, fully described; Lischke, Jap. Meer. Conch. iii. p. 99, pl. viii. figs. 4-6; *S. olivacea* (Jay), *id. l. c.* p. 98, pl. viii. figs. 7-12, distinct from *nuttalli* (Conrad).

Psammobia lineolata (Gray); Smith, *l. c.* fig. 11.

Tellina jeddoensis (Lischke, 1873) and *minuta* (*id.* 1872), from Yeddo, fully described; Lischke, Jap. Meer. Conch. iii. pp. 92 & 94, pl. ix. figs. 1-3, 4-6. *T. iridescens* (Bens., 1842) = *carnea* (Philippi, 1844). On the differences of *T. inquinata*, var. *incongrua* (Martens), from *nasuta* (Say); *id. l. c.* pp. 93 & 95.

Tellina novæ-caledoniæ and *bifaria*, spp. nn., Baird, in Brenchley's Cruise of the Curaçoa, p. 451, pl. xli. New Caledonia.

Lucinopsis divaricata (Lischke, 1872), from Yeddo, fully described; Lischke, *l. c.* p. 90, pl. vii. figs. 12-14.

Donax affinis (Desh.), from the Persian Gulf, and *D. trunculus* (L.), from the Black Sea; Martens, Vorderasiat. Conch. pp. 104 & 77, pl. ix. figs. 59 & 60.

Donax dysoni (Desh.) = *introradiatus* (Römer, nec Reeve); Lischke, *l. c.* p. 91, Japan.

PAPHIIDÆ.

[*Mesodesma*] *Ceronia donacia* (Lam.); soft parts described by Tapparone-Canefri, Malac. viagg. Magenta, pp. 122, pl. iv. fig. 3.

[*Mesodesma*] *Taria ventricosa* (Gray); E. Smith, Moll. Voy. Ereb. & Terr. p. 5, pl. iii. fig. 6.

MACTRIDÆ.

Mactra discors (Gray), juv., *M. (Spisula) æquilateralis* (Desh.), and (*Standella*) *ovata* (Gray); E. Smith, *l. c.* pl. ii. figs. 4, 10, & 2.

Vanganella taylori (Gray); *id. l. c.* fig. 5.

Lutraria nuttalli (Conrad); soft parts described by Tapparone-Canefri, Malac. viagg. Magenta, p. 123, pl. iii. fig. 5.

VENERIDÆ.

Dosinia genæi, sp. n., Tapparone-Canefri, *l. c.* p. 127, pl. iii. fig. 4, St. Thomas Island.

Dosinia subrosea (Gray); E. Smith, Moll. Voy. Ereb. & Terr. pl. iii. fig. 1, type.

Dosinia troscheli (Lischke, 1873), from Southern Japan, fully described; Lischke, Jap. Meer. Conch. iii. p. 89, pl. viii. figs. 1-3. *D. japonica* (Rve.) is a large variety of it; *id. l. c.* p. 88.

Circe undatina (Lam.), from Yeddo. On its very near affinities to *scripta* (L.); *id. l. c.* p. 87.

Meroe. List of known species, and *M. ratersiana* (Crosse) fully described; Crosse, J. de Conch. xxii. pp. 89-97, pl. iii. fig. 7. *M. excavata* (Hanley, 1842) = *menstrualis* (Menke) = *magnifica* (Reeve), from Japan, distinct from *M. vaginalis* (Menke), from Australia, which has been figured as *excavata* by Römer; Lischke, *l. c.* pp. 365-368.

Tapes schnellianus (Dkr.), *amabilis* (Phil.), and *euglyptus* (Phil.) var.; *id. l. c.* pp. 80-82, pl. vi. figs. 1-4, 5-7, 8-11. *T. semidecussatus* (Desh.) and *ducalis* (Römer) = *philippinarum* (A. Ad.) varr.; *id. l. c.* pp. 78 & 79, all from Japan. The length of the pallial sinus is somewhat variable in *T. papilionaceus* (L.) and *T. euglyptus* (Phil.); *id. l. c.* p. 81.

Venus jed[d]oensis, sp. n., *id.* JB. mal. Ges. i. p. 57, and *l. c.* p. 84, pl. vii. figs. 1-9, Yeddo.

Venus oblonga (Gray); E. Smith, Moll. Voy. Ereb. & Terr. pl. ii. fig. 1. *Dosinia zelandica* (Gray) is a variety of this species; *id. l. c.* p. 6.

Venus roseotincta, sp. n., Baird, in Brenchley's Cruise of the Curaçoa, p. 452, pl. xlii. figs. 1-3, New Caledonia.

Venus (Chione) yatii (Gray), and *stutchburii* (Gray); Smith, *l. c.* pl. iii. figs. 11 & 4.

Venus (Gomphina) melanægis (Römer), from Yeddo; Lischke, *l. c.* p. 86, pl. vii. figs. 10 & 11.

Venerupis (Lam.). Monograph by Sowerby in Reeve's *Conchologia Iconica*, parts 318 & 319; 30 species, on 4 plates. *V. attenuata*, sp. n., fig. 7, locality unknown.

Venerupis reflexa (Gray) = *paupercula* (Desh.), and *V. elegans* (Desh.); E. Smith, *Moll. Voy. Ereb. & Terr.* p. 6, pl. ii. figs. 3 & 6.

PETRICOLIDÆ.

Petricola (Lam.). Monograph by Sowerby, *l. c.*; 24 species, on 3 plates. *P. incerta*, fig. 10, and *æquistriata*, fig. 19, spp. nn., locality unknown.

GLAUCONOMIDÆ.

Glaucanoma isseliana [-num], sp. n., Tapparone-Canefri, *Malac. viagg. Magenta*, p. 130, pl. iii. fig. 2, Taku, China, in brackish water.

CYRENIDÆ.

Corbicula fluminalis (Müll.) = *consobrina* (Cailliaud) = *cor* (Lam.) = *sauleii* (Bourg.) = *crassula* (Mouss.), several varieties from Egypt, Jickeli, *Verh. L. C. Ak.* xxxvii. pp. 283-287, pl. xi. figs. 4-9; from Syria, Martens, *Vorderasiat. Conch.* p. 37, pl. ix. figs. 56 & 57; and from Samarcand, *id.* in Fedchenko's *Turkest. Moll.* p. 34, pl. ii. fig. 29. Mousson treats *C. fluminalis* (Müll.), from the Tigris, and *cor* (Lam.), from the Euphrates, as distinct species, adding *tigridis*, sp. n., Tigris; J. de Conch. xxii. pp. 54 & 55.

Corbicula radiata (Phil.), Sennaar, and *pusilla* (Phil.), Assuan, Sennaar, and White Nile, are distinct; Jickeli, *l. c.* pp. 287 & 288, pl. xi. figs. 10 & 11, 12.

Corbicula zeilebori, sp. n., *id.* *l. c.* p. 290, pl. xi. fig. 13, Freshwater Channel, near Suez.

Corbicula minima, sp. n., Clessin, in Fedchenko's *Turkest. Moll.* p. 35, pl. iii. fig. 30, Samarcand.

Cyrena orientalis (Lam.) = *Corbicula japonica* (Prime), *C. oblonga* (Quoy) belongs to the genus *Glaucanome*; Prime, *Ann. Lyc. N. York*, x. pp. 188 & 189.

Leptosiphon, sub-g. n. of *Cyrena*, distinguished by rather short, narrow siphons, and a distinct, rather long and narrow, pallial sinus; type, *C. carolinensis* (Bosc.). Fischer, *Ann. Lyc. N. York*, x. pp. 191-194, & 195, pl. viii. figs. 1-4.

Cyrenocapsa, sub-g. n. of *Cyrena*, distinguished by short, narrow siphons, and a rudimentary pallial sinus; type, *C. floridana* (Conrad). *Id.* *l. c.* pp. 194 & 195, pl. viii. figs. 5 & 6.

These two sub-genera are peculiar to America; and the American species of *Corbicula* differ from those of the old world in having an evident pallial sinus; *id.* *l. c.* p. 196.

Cyclas capensis (Krauss), from Abyssinia, and *hartmanni*, sp. n., from

Nubia; Jickeli, Verh. L. C. Ak. xxxvii. pp. 291 & 292, pl. xi. figs. 14 & 15.

Sphaerium argentinum (Orb.), Strobel, Malac. Argent. p. 77, San Carlos, Bahía Blanca and Patagonia.

Limosina ferruginea (Krauss, as *Cylas*) = *Pisidium parasiticum* (Parr-eyss, Desh.) lives between the shells of *Ætheria* in the White Nile and Bahr-el-ghasal; the young are fixed on the shells. Jickeli, l. c. pp. 293–295, pl. xi. figs. 16 & 17.

Pisidium pileus, sp. n., Clessin, CB. Ver. Regensb. xxvii. p. 150, Alpe-see, Bavaria.

Pisidium obliquatum, *sphaeriiforme*, and *turanicum*, spp. nn., *id.*, in Fedchenko's Turkest. Moll. pp. 36–39, pl. iii. figs. 31–34, Samarcand.

GLOSSIDÆ.

Kelliella abyssicola (Sars) confirmed as the fry of *Isocardia cor*; Monterosato, J. de Conch. xxii. p. 252.

LUCINIDÆ.

Diplodonta zelandica (Gray); E. Smith, Moll. Voy. Ereb. & Terr. pl. iii. fig. 8, type.

Axinus granulatus (Jeffer) in the Mediterranean; Monterosato, l. c. p. 251.

KELLIIDÆ (ERYCINIDÆ).

Lepton glabrum, sp. n., *lacerum* and *subtrigonum* (Jeffer, MS.); Fischer, Fonds de mer, ii. pp. 83 & 84, pl. ii. figs. 9–11, and Act. Soc. L. Bord. xxix. p. 176, Cape Breton, S. W. France, 35–70 fathoms.

Vasconia, new name for *Hindsia* (Desh., nec. A. Ad.) [already named *Hindsiella* by Stoliczka, 'Pelecypoda,' p. 266, 1870]; *V. jeffreysiana*, sp. n., Fischer, Fonds de mer, ii. p. 83, pl. ii. fig. 8, and Act. Soc. L. Bord. xxix. p. 178, Cape Breton, 40 fathoms.

GALEOMMATIIDÆ.

Galeomma (Sow.). Monograph by Sowerby in Reeve's Conchol. Icon. parts 310 & 311, figuring 9 species, on 1 plate.

Scintilla (Desh.). Monograph by Sowerby, *tom. cit.*; 54 species on 6 plates. *S. aperta*, fig. 21, Mauritius, *membranacea*, fig. 39, and *opaca*, fig. 54, localities unknown, spp. nn.; *S. purpurascens*, new name for *rosea*, Sow., nec. Desh.

Scintilla recondita and *crispata*, spp. nn., Fischer, Fonds de mer, ii. pp. 49 & 83, pl. ii. figs. 3 & 7, Cape Breton, 35–70 fathoms. The descriptions copied, and the former species transferred to *Sportella* (Desh.); *id.*, Act. Soc. L. Bord. xxix. p. 177.

Barclaya, g. n., allied to *Galeomma* and *Scintilla*, provided with hinge-teeth, valves solid, not polished, closed all round; for *Scintilla incerta*

(Desh., Cat. moll. Réunion). H. Adams, P. Z. S., 1874, p. 585, pl. lxi. fig. 3, Mauritius and Réunion.

ASTARTIDÆ.

Astarte (Sow.). Monograph by Sowerby in Reeve's Conchol. Icon. parts 318 & 319; 21 species on 3 plates. *A. abbreviata*, fig. 6, locality unknown, *semilirata*, fig. 15, and *subtrigona*, fig. 20, Northern Seas, and *producta*, fig. 19, Northern Europe [variety of *arctica* ?], are apparently new.

Astarte crebricostata (Forbes). A remarkable pale-coloured var. from E. Greenland; Möbius, Zweite Deutsche Nordpolarfahrt, ii. p. 252.

Cardita aculeata (Poli) in the zone of *Laminaria*, *C. trapezia* (Mull.) littoral; Monterosato, J. de Conch. xxii. p. 252.

UNIONIDÆ.

The development of *Anodonta* is the subject of a paper by W. Fleming, Arch. mikr. Anat. x. pp. 257-293, pl. xvi., and of another by Von Ihering, SB. Ges. Leipzig, i. pp. 3-8; the former minutely describes the egg in the ovary, and its first changes after fecundation, which he supposes is effected in the gills; the latter notes the first appearance of the shell and the byssal gland in the mature embryo.

S. Clessin, Mal. Bl. xxii. pp. 1-29, pl. i. figs. 1-4, discusses the generic characters in this family, admitting the following 16 genera:—

1. Sub-family *Unionidæ*; mantle open for its whole length: *Unio* (Retz), *Anodonta* (Cuv.) [Brug.], *Margaritana* (Schum.), *Monocondylæa* (Orb.), *Microcondylæa* (Vest), type *Unio bonellii* (Fér.), *Mycetopus* (Orb.), *Byssanodonta* (Orb.), *Dipsas* (Lea) [Leach], and *Plagiodon* (Lea).
2. Sub-family *Mutelidæ*; mantle closed at the hinder extremity; *Spatha* (Lea), type *rubens* (Lam.), *Mutela* (Scop.), type *dubia* (Gmél.), *Pliodon* (Conrad), *Hyria* (Lam.), *Castalia* (Orb.) [Lam.], and *Leila* (Gray).

The animals of *Monocondylæa*, *Dipsas*, and *Plagiodon*, are unknown; those of *Spatha cailliaudi* (Mart.) and *Mutela caelestis* (Lea), distinct by two short siphons, are described.

The index to Lea's observations on the genus *Unio*, part iii., prepared by J. Lewis, contains references to the species described in vol. xiii., and all anatomical and structural details, habits, and other peculiarities of the *Unionidæ*, contained in vols. i.-xiii.

S. Clessin has observed that the dark girdles on the shells of *Unio* and *Anodonta* are really annual marks, as the animals are not quite inactive in winter, when they secrete epidermal [cuticular], but no calcareous, matter on the edge of the shell. Nachr. mal. Ges. 1874, pp. 25-29.

Anodonta. S. Clessin, in the 2nd edition of the conchological work of Martini and Chemnitz, has published two further parts (Nos. 67 & 68, containing descriptions and figures of 87 species, pp. 63-152, pls. xvi.-li.) of

the monograph commenced by Küster in 1838. The following are new, or not before figured:—*tenella* (Held.), p. 63, pl. ix. fig. 5, and *gibba* (Held.), p. 81, pl. xiv. figs. 1 & 2, Bavaria; *subcircularis*, sp. n., p. 87, pl. xxii. fig. 2, Lake of Scutari; *oviformis*, sp. n., p. 88, pl. xxvi. fig. 5, Lake Constance; *bahiensis* (Küster), p. 94, pl. fig. 2, Brazils; *capitata*, (Küster), p. 125, pl. xxxix. figs. 1 & 2, and *limpida* (Parr.), p. 126, pl. lx. figs. 1 & 2, Dalmatia; *japonica* (Martens, MS.), p. 144.

The species figured by Clessin as *Anodonta arcuata* (Cailliaud), p. 145, pl. xlvii. figs. 1 & 2, appears to be some European form. Cailliaud's species belongs to *Spatha*; Jickeli, Verh. L. C. Ak. xxxvii. p. 265. *Anodonta complanata* (Ziegl.) is the only European species quite distinct from *cygnea*; Clessin, Nachr. mal. Ges. 1874, pp. 85 & 86.

Anodonta cellensis (Schröt.) [Gmél.], in ditches and ponds, and typical and rostrated forms of *A. anatina* (L., Brot), several varieties, *pictetiana* (Mortillet), and *charpentieri* (Küst. ?) in the lakes of Neuchatel and Morat, the last-named species shortly described; P. Godet, Bull. Soc. Neuch. vii. 1870-73, pp. 145-151.

Anodonta vescoiana (Bourg.) var. n. *mesopotamica*, and *A. schlaefli*, sp. n., very near the preceding; Mousson, J. de Conch. xxii. pp. 50 & 51, Lower Mesopotamia.

Anodonta edulis, sp. n., Heude, tom. cit. p. 117, Song-Kiang-Fu, China.

Anodonta exilior (Lea, P. Ac. Philad. 1871), Lea, J. Ac. Philad. (2) viii. p. 24, pl. vii. fig. 21, = Observ. Union. xiii. pl. vii. fig. 21, Mexico.

Anodonta exotica (Lam.), *latimarginata* (Lea), and *puelchana* (Orb.); Strobel, Malac. Argent. pp. 66-69, Argentine States.

[*Dipsas*] *Anodonta herculea* (Midd.); Deshayes, Bull. N. Arch. Mus. ix. p. 1, pl. i. fig. 1, Lake Haetien, Peking, from a specimen measuring 285 mm.

Craspedodonta (Küster, MS.), g. n., distinct from *Anodonta* by a peculiar thin lamella at the hinge of the left valve; founded on *A. smaragdina* (Anton, 1839); Clessin, in Martini & Chemnitz's Conch. Cab., *Anodonta*, p. 93, pl. xxvii. fig. 2, locality uncertain, perhaps America. [Evidently a young shell.]

Margaritana euphratica (Bourg.) and allied forms, from Mesopotamia; Martens, Vorderas. Conch. pp. 35 & 36, pl. viii. fig. 35, and Mousson, J. de Conch. xxii. p. 52. *M. mardinensis* (Lea), Tigris, id. l. c. p. 53.

Margaritana spillmani (Lea), embryonal shell; Lea, J. Ac. Philad. (2) viii. p. 69, pl. xxi. fig. 15, = Observ. Union. xiii. same figs.

Monocondylea nankingensis, sp. n., Heude, J. de Conch. xxii. pp. 116, Nankin.

Unio globatus, *validus*, *subglobatus*, *lawii*[-wix], *obuncus*, *recurvatus*, *tuscumbiensis*, *appressus*, *radiosus*, *crudus*, *circumactus*, *pattinoideus*, *litus*, *cahabensis*, *simulans*, *dispanus*, *santeensis*, *radiolus*, *pealii*, *acuens*, *flavidus*, *pauciplicatus*, *lenticularis*, *tellicoensis*, *yadkinensis*, *conasaugensis*, *conspicuus*, *brevis*, *andersonensis*, *vesicularis*, *curvatus*, *amplus*, *insolidus*, *attenuatus*, *differtus*, *cuspidatus*, *rostellum*, *irvinensis*, *exacutus*, *subparallelus*, *subsquamosus*, *basalis*, *ligatus*, *bellulus*, *infusus*, *oblongus*, *ratus*, *dissimilis*, *cirratu*, *hastatus*, *strumosus*, *subolivaceus*, *subcylindraceus*, *corneus*,

infulgens, *dooleyensis*, *gesneri*, and *invenustus*, all North American, mostly from Georgia and South Carolina, Lea, *Observ. Union.* xiii. pp. 1-75, pls. i.-xxii.; also in J. Ac. Philad. (2) viii. pp. 5-66, same pls., most of them described also previously in P. Ac. Philad. 1869-1873.

Unio ksibanus, sp. n., Mousson, JB. mal. Ges. i. p. 104, pl. v. fig. 6, Ued Ksib, Morocco [very near *litoralis* (Drap.)].

Unio aegyptiacus (Fér.), including as varieties *niloticus* (Fér.), and *rugifer* (Küst.), variable in form and colour of nacre; Jickeli, Verh. L. C. Ak. xxxvii. p. 271, pl. x. figs. 1-9; *U. parreyssi* (Busch) = *sennariensis* (Küst.), p. 273; *U. teretiusculus* (Philippi) = *cailliaudi* (Fér.), p. 276, pl. xi. figs. 1-3, all from the Nile.

Unio aeneus (Frankfort Mus.), sp. n., *id. l. c.* p. 274, pl. ix. fig. 2, and *U. dembea* (Rossm., Reeve), *id. l. c.* p. 275, pl. ix. figs. 3 & 4, both from Dembea Lake, Abyssinia.

Unio abyssinicus (Martens); *id. l. c.* p. 278, pls. ix. fig. 5, x. fig. 10, Dembea Lake.

Unio tigridis (Fér.) = *dignatus* (Lea) = *truncatus* (Swains., 1829), Tigris, Martens, Vorderas. Conch. pp. 35 & 124, pl. vi. fig. 53; also Mousson, J. de Conch. xxii. p. 54. *U. hueti* (Bourg.) = *mussolianus* (Parr.) = *mossulensis* (Lea), Mesopotamia; Martens, *l. c.* p. 35, pl. vii. fig. 54.

Unio pfisteri, *rufescens*, *celtiformis*, *heudii* (Bazin, MS.), *capitatus*, *pisciculus*, and *languilati*, spp. nn., Heude, J. de Conch. xxii. pp. 112-116, Kiangsi and Kiangsu, China. *U. sculptus*, sp. n., Deshayes, Bull. N. Arch. Mus. ix. p. 9, pl. ii. fig. 3, Petscheli, China [scarcely different from *douglasia* (Gray) = *murchisonianus* (Lea)].

Unio moretonicus (Rv.); E. Smith, Moll. Voy. Ereb. & Terr. pl. iv. fig. 2, Australia.

Unio jeffreysianus, p. 23, pl. vii. fig. 20, Australia; *macneili*, p. 25, pl. viii. fig. 22, Nicaragua; *stevensi*, p. 22, pl. vii. fig. 19, Yuruari River, British Guiana: spp. nn. Lea, J. Ac. Philad. (2) viii. (*Observ. Union.* xiii. same figs.).

Soft parts of *Unio tappanianus*, *rowelli*, and *hydeianus*, and embryonal shells of 14 North American species of *Unio* described; *id. l. c.* pp. 67-69 pl. xxi. figs. 1-14.

Unio variabilis (Maton), *wheatleyanus* (Lea), *delodon* (Lam.), and *patagonicus* (Orb.), the last with many varieties; Strobel, Malac. Argent. pp. 69-75, Argentine States.

Mycetopus iridineus, sp. n., Heude, J. de Conch. xxii. p. 117, China.

Mycetopus (?) *rugatus* (Sow.); E. Smith, *l. c.* pl. iv. fig. 1, Victoria River, Australia.

Spatha cailliaudi (Martens), Nile, distinct from *rubens* (Lam.), of W. Africa, *hartmanni* (Martens), Sennaar, *marnoi*, sp. n., Bahr Seraf, and *lepsi*, sp. n., Upper Egypt; Jickeli, Verh. L. C. Ak. xxxvii. pp. 259-265, pls. viii. figs. 1, 2, 3, ix. fig. 1. The colour of the nacre is variable.

Mutela nilotica (Fér.), *angustata* (Sow.), *rostrata* (Rang) = *caelestis* (Lea), and *plicata* (Parreyss), = *Mycetopus plicatus* (Reeve), all from the Nile; *id. l. c.* pp. 266-270.

MYTILIDÆ.

Mytilus edulis (L.). On its breeding in Taranto; Kobelt, Zool. Gart. xv. pp. 8-11, chiefly from statements made by Targioni-Tozzetti [Zool. Rec. ix. p. 125].

Mytilus (*Hormomya*) *bæcki*, sp. n., (*Aulacomya*) *diluculum*, sp. n., and (*Chloromya*) *pusio* (Phil.), var., from Norway, Mörch, Förh. Skand. Naturf. möte 1873, Kjöbenhavn (1874), pp. 376 & 377, and J. de Conch. xxii. pp. 174-176, the last perhaps also in the Straits of Magalhaens [?].

Mytilus fischerianus, sp. n., Tapparone-Canefri, Malac. viagg. Magenta, p. 138, pl. iv. fig. 1, Halt Bay, Patagonia; *magellanicus* (Chemn.), distinct from the S. African *crenatus* (Lam.) and the Peruvian *americanus* (Orb.), *id. l. c.* pp. 140 & 141, the last figured, pl. iv. fig. 5.

Septifer grayanus (Dunker) from Japan; *id. l. c.* p. 146, pl. iv. fig. 2.

Modiola bellardiana, sp. n., *id. l. c.* p. 144, pl. iv. fig. 4, Yokohama.

Modiola aterrima (Dall, Nov. 1871) = *Mytilus atratus* (Lischke, Feb. 1871); Lischke, Jap. Meer. Conch. iii. p. 109.

Modiolaria semigranata (Reeve, as *Lithodomus*) from Yeddo; *id. l. c.* p. 110, pl. ix. figs. 18 & 19.

Lithodomus truncatus (Gray); E. Smith, Moll. Voy. Ereb. & Terr. pl. ii. fig. 12, type.

[*Lithodomus*] *Lithophagus curtus*, sp. n., Lischke, JB. mal. Ges. i. p. 59, and *l. c.* p. 111, pl. ix. figs. 14-17, Yeddo.

DREISSENIDÆ.

Dreissena cochleata (Kickx) found by J. de Guerne in the channel between Bergues and Dunkirk; Bull. Soc. L. N. Fr. 1873, J. de Conch. xxii. p. 399.

AVICULIDÆ.

Avicula ala-corvi (Chemn.). On its soft parts, Tapparone-Canefri, Malac. viagg. Magenta, p. 147.

Avicula margaritifera (L.) from the Persian Gulf; Martens, Vorderas. Conch. p. 102.

Meleagrina pica (Gould) from Japan; on its variability, Lischke, Jap. Meer. Conch. iii. p. 112.

Perna (*Isognomon*) *samoensis*, sp. n., Baird, in Brenchley's Cruise of the Curaçoa, p. 454, pl. xlii. fig. 8, Samoa Islands.

ARCIDÆ.

Arca bouvieri, sp. n., P. Fischer, J. de Conch. xxii. p. 206, Cape Verde Islands.

Arca novæ-caledoniæ and (*Byssarca*) *dubia*, spp. nn., Baird, in Brenchley's Cruise of the Curaçoa, p. 452, pl. xlii., New Caledonia.

Arca foliata (Forskal) var. from the Persian Gulf; Martens, Vorderas. Conch. p. 103, pl. ix. fig. 58.

Pectunculus planatus, sp. n., G. & H. Nevill, J. A. S. B. (n.s.) xliii. pt. 2, p. 29, pl. i. fig. 16, Andamans.

Pectunculus albilineatus (Lischke, 1872) from Yeddo, fully described; Lischke, Jap. Meer. Conch. iii. p. 108, pl. ix. figs. 11 & 12.

Limopsis compressa, sp. n., G. & H. Nevill, l. c. p. 28, pl. i. fig. 17, Andamans.

NUCULIDÆ.

Nucula strangii (A. Ad.); E. Smith, Moll. Voy. Ereb. & Terr. pl. ii. fig. 14.

Neilo australis (Q. G.), id. l. c. fig. 13.

Malletia (Desm.). The few known species enumerated, and *Yoldia obtusa* (Sars, 1872), from Norway, placed in this genus, by Mörch, Förh. Skand. Naturf. möte 1873, Kjöbenhavn, p. 375, and J. de Conch. xxii. pp. 177-179.

SOLEMYIDÆ.

Solemya parkinsoni (Gray, MS.), sp. n., E. Smith, l. c. p. 6, pl. iii. fig. 1, New Zealand.

TRIGONIIDÆ.

Trigonia pectinata (Lam.). On its different forms; Tapparone-Canefri, Malac. viagg. Magenta, p. 137.

PECTINIDÆ.

Pecten pustulosus, sp. n., Verrill, Am. J. Sci. (3) v. [1873] p. 14, note, St. George's Bank, New England, 150 fathoms.

Pecten secernendus, Tapparone-Canefri, l. c. p. 149, pl. iv. fig. 6, Hongkong; *P. lamberti*, Souverbie, J. de Conch. xxii. p. 200, pl. vii. fig. 9, New Caledonia; *P. similis*, Baird, in Brenchley's Cruise of the Curaçoa, p. 453, pl. xlii. fig. 7, Friendly Islands: spp. nn.

Pecten zelandiae (Gray); E. Smith, l. c. pl. iii. fig. 7, type.

OSTREIDÆ.

P. Fischer reviews the present state of oyster-breeding at Arcachon, the final results of which he considers quite satisfactory; the bad results of former years are attributed to the pernicious action of frost and excessive heat, to the ravages of a crab, *Carcinus maenas* (L.), &c. *Ostrea angulata*, from Portugal, is definitely acclimatized. Act. Soc. L. Bord. xxix. pp. 163-168.

The same subject has been treated by L. Soubeiran, Auschitzky, and De Rochbrune, in a publication of the "Association française pour l'avancement des sciences," 1st session, Bordeaux, 1873, pp. 614, 620 & 624. *Ostrea virginiana* (Gmél.) stated to be truly hermaphrodite, with

notes on its food and eggs, and on some parasites, by J. McCrady, P., Bost. Soc. xvi. pp. 170-192; it spawns from May to November.

Ostrea discoidea (Gould ?) from New Zealand; E. Smith, Moll. Voy. Ereb. & Terr. pl. ii. fig. 15.

Ostrea gigas (Thunberg) and *denselamellosa* (Lischke): on their synonymy; the latter = *auriculata* (Sow., 1871). Lischke, Jap. Meer. Conch. p. 114.

ANOMIIDÆ.

Anomia (*Placunanomia*) *zelandica* (Gray); E. Smith, *l. c.* pl. iii. fig. 10, type; fig. 9, scar of the plug.

MOLLUSCOIDA.

BY

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LIST OF MORE IMPORTANT PUBLICATIONS.

BUSK, G. Notice of a new Polyzoon (*Hippuraria egertoni*). P. Z. S. 1874, pp. 29 & 30, pl. v.

DALL, W. H. Recent species of *Brachiopoda*. P. Ac. Philad. 1873, p. 177.

FOL, H. Note sur l'endostyle et sa signification physiologique. Arch. Z. expér. iii. p. liii.

——. Sur un nouveau genre d'Appendiculaires. *Tom. cit.* p. xlix.

[Both not seen by the Recorder.]

GIARD, A. Sur la structure de l'appendice caudal de certaines larves d'Ascidies. C. R. lxxviii. pp. 1860–1863.

HELLER, C. Untersuchungen über die Tunicaten des Adriatischen Meeres. Denk. Ak. Wien, xxxiv. 20 pp. 6 pls.

KIRCHENPAUER, —. Grönlandische Bryozoen. Leipzig: 1874, 8vo.

[Separate print from "Die zweite deutsche Nordpolarfahrt" (*antea*, p. 114), ii. pt. 12, pp. 417–428.]

KOROTNIEFF, A. A. [The budding gemmation in *Paludicella*.] Nachr. Ges. Mosc. x. pt. 2.

In Russian. An abstract in German by Hoyer, in JB. Anat. Physiol. iii. pp. 369–372.

KOWALEWSKY, A. O. Nawljudenija nad Raswitiem *Brachiopoda*. Nachr. Ges. Mosc. xiv. Also as separate print, 1874, 40 pp. 5 pls.

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——. Ueber die Knospung der Ascidien. Arch. mikr. Anat. x. pp. 441–470, pls. xxx. & xxxi.

LACAZE-DUTHIERS, H. Les Ascidies simples des côtes de France. Arch. Z. expér. iii. pp. 530–656, with 15 pls.

[Not seen by the Recorder.]

- LANKESTER, E. RAY. On the heart of *Appendicularia furcata* and the development of its muscular fibres. Q. J. Micr. Sci. xiv. pp. 274-277, pl. xii. [Zool. Rec. x. p. 181.]
- MORSE, E. S. Embryology of *Terebratulina*. Mem. Bost. Soc. ii. pp. 249-264, pls. viii. & ix.
- . On the systematic position of the *Brachiopoda*. P. Bost. Soc. xv. (1873) pp. 315-375, with numerous figures. Abstract in Am. J. Sci. (3) vii. pp. 154-158.
- NITSCHKE, H. Untersuchungen über die Knospung der Süsswasser-Bryozoen, insbesondere der *Alcyonella*. SB. Ges. Leipzig, i. pp. 31-36.
- REUSS, A. E. VON. Die fossilen Bryozoen des Österreich. Ungarischen Miocäns. I Part: *Salicornaridea*, *Cellularidea*, *Membraniporidae*. Denk. Ak. Wien, xxxiii. pp. 141-190, 12 pls. Also as separate print, Wien: 1874, 50 pp. 12 pls.
- SALENSKY, W. Untersuchungen an See-Bryozoen. Z. wiss. Zool. xxii. pp. 343-348, pl. xxxii.
- SARS, G. O. On *Rhabdopleura mirabilis*. Q. J. Micr. Sci. (2) xiv. 23-44, pl. i.
- SMITT, F. A. Florida *Bryozoa*. Sv. Ak. Handl. 1873, part i. 20 pp. 5 pls.; part ii. 84 pp. 13 pls.
- [Not seen by the Recorder.]
- TELLKAMPF, T. Notes on the *Ascidia manhattensis* and on the *Mammalia manhattensis*. Ann. Lyc. N. York, x. pp. 83-91, pl. iii.
- TODARO, F. Sullo sviluppo e sull'anatomia delle Salpe. Atti Ac. Rom. (Feb. 1874).
- [Not seen by the Recorder.]
- USSOW, M. M. Untersuchungen über den Bau und die Entwicklung der Tunicaten. Arb. Petersb. Ges. v. pp. xxii. & xxxviii.

The formation of the egg in the *Molluscoidea* is reviewed, with careful reference to the literature on the subject, by H. LUDWIG, Arb. Inst. Würzb. i. pp. 365-369 & 379, = Verh. Ges. Würzb. (2) vii. pp. 111-114 & 125. In all, the egg represents a simple cell; and it is included in a follicle of the ovary in the *Tunicata*. In the *Ascidians* only, the egg is surrounded in the follicle by a membrane produced by the cells of the follicle itself, and therefore to be called a chorion; in this respect, the egg of the *Ascidians* is also essentially different from that of the *Mollusca*. The opinion of Kowalewsky, that the so-called testal cells between the chorion and yolk immigrate from the follicle, instead of being produced within the protoplasm of the egg, is corroborated by fresh observations made by C. SEMPER, *op. cit.* p. 367.

CONTRIBUTIONS TO FAUNAS.

K. MÖBIUS enumerates 2 Brachiopods, *Terebratula* [*Rhynchonella*] *psittacea* and *T. cranium* (Müll.), and KIRCHENPAUER 26 species of *Bryozoa*, found by the second German Arctic Expedition on the east coast of Greenland, between 73° & 75° N. latitude. *Zweite deutsche Nordpolarfahrt*, ii. pt. 7, p. 253, and pt. 12, pp. 417-428.

Cynthia echinata (Müll.) from Nova Zembla, *C. prunum* (Müll.) and *Didemnum roseum* (Chiaje) from Arctic Norway; Ehlers, SB. Ges. Erlang. v. [1873] p. 7.

W. E. MACINTOSH gives a list of *Tunicata* and *Polyzoa* observed at St. Andrews; Ann. N. H. (4) xiii. pp. 302-315.

A. E. VERRILL gives lists of *Brachiopoda*, *Tunicata*, and *Polyzoa* dredged on the coasts of New England; Am. J. Sci. (3) v. pp. 14, 101, vii. pp. 39-41, 43, 44, 46, 135, 409, 413 & 504. J. F. Whiteaves, *tom. cit.* p. 212, notes *Polyzoa* from the Gulf of St. Lawrence.

LACAZE-DUTHIERS discusses the simple Ascidians of the coasts of France; Arch. Z. expér. iii. pp. 530-656, 15 pls.

W. DALL names two known species of *Brachiopoda* and three of *Tunicata* from the Behring Sea; P. Cal. Ac. Feb. 1874.

The *Bryozoa* collected by Count S. F. de Pourtalès during his deep-sea dredgings in the Straits of Florida, are the subject of an important treatise by F. A. SMITT, which the Recorder regrets very much not to have seen.

Some *Brachiopoda* and *Tunicata* and many *Polyzoa*, from the Pacific and Australia, with exact localities, are enumerated in the 5th Catalogue of the Museum Godeffroy, Hamburg, pp. 181-184.

Terebratella rubicunda, *Rhynchonella nigricans* in shallow water to 5 fathoms, *T. cruenta*, *Waldheimia lenticularis*, *Kraussia lamarckiana*, and *Magas cumingi* to 100 fathoms, living on the coast of New Zealand. J. HAAST, Verh. geol. Reichsanst. 1874, pp. 253-255.

BRACHIOPODA.

The researches of A. O. KOWALEWSKY afford a complete account of the development of *Argiope neapolitana* (Scacchi) and *Thecidium mediterraneum* (Risso), and several valuable facts as to the development of other Brachiopods. The first formation of the embryo offers a remarkable difference between *Argiope* and *Thecidium*, as in the former the inner cavity is formed by invagination of the blastoderm, and in the latter by interstitial cleaving. *Terebratula* and *Terebratulina* appear to agree with *Argiope* in this respect. The further development is analogous in all of them; the larva has three segments, the foremost, or head, provided with four eyes in *Argiope* and *Thecidium*, the second, with four tufts of bristles, which are afterwards thrown away, and the last serving for fixing the animal. After fixture, the mantle and shell are produced from the second segment. The arms

make their first appearance in the shape of several (generally ten) hollow appendages, disposed in a circle. Nachr. Ges. Mosc. xiv. 40 pp. 5 pls.

E. MORSE has continued his researches on the development of the Brachiopods, and succeeded in connecting the free-swimming ciliated larva and the attached bivalve animal by observations on *Terebratulina septentrionalis* (Couth.), at Eastport, Maine. The larva in this genus is eyeless, and fixes itself at a very early stage, still exhibiting three distinct segments and no trace of shell: it is only after fixture that the middle or thoracic segments expand into a dorsal and a ventral fold, giving origin to the mantle and shell. Mem. Bost. Soc. ii. pp. 249-264, pls. viii. & ix. The same author endeavours (in a somewhat extended paper) to show that "in every point of their structure, the *Brachiopoda* are true worms, with possibly some affinities to the *Crustacea*, and that they have no relations to the *Mollusca*, save what many other worms may possess in common with them." [Cf. Zool. Rec. vii. p. 181, viii. p. 174.] He points out a number of characters in which the majority of Worms and Mollusks differ, and Brachiopods approach the latter (*e. g.*, the perfect lateral symmetry); and some remarkable similarities between the Brachiopods and distinct orders of Worms, such as the extended vascular system with red blood, the chitinous appendages, and several points in the embryology. Others are evidently of minor importance, as the fabrication of tubes by agglutination of sand in *Lingula*, &c. P. Bost. Soc. xv. pp. 315-375, with numerous figures. Some critical remarks on this paper, by Verrill, Am. J. Sci. (3) vii. pp. 154-158.

The known recent species (104) of *Brachiopoda* are enumerated by W. DALL; P. Ac. Philad. 1873, p. 177.

Terebratula frontalis (Midd.) found in North Japan, 35 fathoms; Davidson, J. L. S. xii. p. 109.

Terebratula cernica (Crosse); Crosse, J. de Conch. xxii. p. 75, pl. i. fig. 3, Mauritius.

Platidia davidsoni (Deslongch.) from Cape Breton, Landes: conchological and anatomical observations by P. Fischer, Act. Soc. L. Bord. xxix. pp. 170-172.

Lingula jaspidea and *lepidula* (A. Ad.) = *anatina* (Brug.) varr.; Lischke, Jap. Meer. Conch. iii. p. 115, pl. ix. figs. 20-24, from Japan.

TUNICATA.

The development of *Molgula* and the "amœboid" movements of the larva, described by LACAZE-DUTHIERS, Arch. Z. expér. iii. p. 643.

The development of *Amaurœcium proliferum* (M. E.) and *Didemnum styliferum*, sp. n., has been observed by A. O. KOWALEWSKY. In the former, the new buds come from the post-abdomen of the mother animal, which is separated from the abdomen and dissolved by

transverse division into several buds, pushed forwards within the mantle. In the latter, a multiplication of the buds themselves by transverse division is stated to take place; in each bud, the further development begins by the inner cavity being separated into three parts, the two lateral forming the perithoracal space, the middle one the branchial sac; the branchial clefts are of late origin; the mouth and anus are formed by sinking inwards from outside, and the genital organs within the skin. Arch. mikr. Anat. x. pp. 441-470, pls. xxx. & xxxi.

The development of the gems in *Botryllus* is the object of a paper by N. KRITSCHAGIN, published in Sapisky Kiev Nat. iii. 1873 (in Russian); the first stages agree to a great extent with those of *Perophora listeri*, described *op. cit.* i. [1870] p. 79.

GANIN's observations on the development of *Didemnum* and *Botryllus* [see Zool. Rec. vii. pp. 185 & 186] have been published in full in a Programme of the University of Warsaw, 1870, No. 4, 66 pp. 9 pls.

Some notes on the development of the individual organs of the *Tunicata* (previously published in an unconnected form) are given by USSOW, Arb. Petersb. Ges. v. pp. xxii. & xxxviii.

GIARD has observed in the tails of the larvæ of *Molgula* and *Cynthia* a structure which he compares with the rays of the fins in young fishes. C. R. lxxviii. pp. 1860-1863. This has been before stated by E. Morse.

Some biological observations on Ascidians and *Botrylli* as to colour, mimicry, &c., by GIARD, Arch. Z. expér. ii. p. 481.

ASCIDIÆ SIMPLICES.

Ascidia mentula (L.) with full anatomical description, *obliqua*, *plebeia*, *rudis*, and *depressa* (Alder), *cristata* (Risso), *scabra* (O. F. Müll.), and *muricata*, *aspera*, *coriacea*, *verrucosa*, *rubescens*, spp. nn., all from the Adriatic Sea; C. Heller, Denk. Ak. Wien, xxxiv. 20 pp. 6 pls.

Ascidia mollis, sp. n., Verrill, Am. J. Sci. (3) vii. p. 409, fig. 2, woodcut, and P. Am. Ass. 1873 (June, 1874), p. 390, pl. i. fig. 5, woodcut, Casco Bay, Maine, 48-107 fathoms.

Chelyosoma geometricum (Stimps.) figured; *id.* P. Am. Ass. 1873, pl. i. fig. 6.

Molgula manhattensis (De Kay, as *Ascidia*) and what appears to be a nurse of it, corresponding to the genus *Mammaria* (Müll.), described by T. Tellkamp, Ann. Lyc. N. York, x. pp. 83-91, pl. iii.

ASCIDIÆ COMPOSITÆ.

Didemnum stytiiferum, sp. n., Kowalewsky, l. c. p. 441, pl. xxx. Red Sea.

SALPÆ.

TODARO's observations on the development and anatomy of *Salpæ*,

communicated to the R. Accademia dei Lincei at Rome, Feb. 1, 1874, have not been seen by the Recorder.

APPENDICULARIIDÆ.

E. RAY LANKESTER's observations on the development of the heart [Zool. Rec. x. p. 181] are fully given and illustrated in Q. J. Micr. Sci. xiv. pp. 274-277, pl. xii. A new genus described by H. Fol, Arch. Z. expér. iii. p. xlix.

POLYZOA.

KOROTNIEFF has observed and minutely described in a species of *Paludicella*:—1. The gemmation or budding of the zoœcium, which he regards as the sexual individual, formed by three primary layers, viz., endocyst, ectocyst, and external chitinous stratum: the budding itself begins by inward folding of the wall of a terminal zoœcium, which finally reaches the opposite wall, and so forms a new individual; a similar process occurs also on the lateral wall of other zoœcia. 2. The budding of the polypid, which he regards as a nourishing individual: this begins by exuberant pullulation of the cells of the endocyst, and soon assumes the form of an ellipsoid, lying parallel with the longitudinal diameter of the zoœcium; the œsophagus, middle intestine, and rectum make their first appearance as distinct cavities, separated by transverse septa; two primitive strata of cells are distinguishable in this bud, the inner one giving origin to the lophophore and nervous system, the outer to the muscular system and intestine, and both participate in the formation of the œsophagus; the greasy bodies are not excreta, but pabulum. 3. The decaying of the polypid. Nachr. Ges. Mosc. x. pt. 2.

W. SALENSKY gives notes on the budding of the marine *Polyzoa*. He states that every bud of a polypid consists of two strata, the inner composed of several layers of globular cells, the outer of one layer of flat spindle-shaped cells, the former giving origin to the tentacular sheath, and outer epithelium of the intestine, the latter to the inner epithelium of the same; the ovaries are homologous to the polypids, as thought by Allman. Z. wiss. Zool. xxii. pp. 343-348, pl. xxxii. figs. 1-3.

H. NITSCHKE confirms, from his own observation, the somewhat strange fact, first observed by Metschnikoff, that in the fresh-water *Polyzoa*, especially in the genus *Alcyonella*, the polypid is formed by a fold of the skin of the cystid, which is directed inwards, the outer epithelium of the cystid or ectoderm forming the inner layers, and the inner epithelium or entoderm the outer layers of the young polypid. Both layers take part in the formation of the intestine, as well as of the lophophore of the polypid. SB. Ges. Leipzig, i. pp. 31-36. Something like the shell-gland of young *Mollusca* is stated to exist in *Lorosoma*; E. R. Lancaster, Q. J. Micr. Sci. xiv. p. 390.

The valuable researches of A. E. v. REUSS into the *Bryozoa* of the Miocene, near Vienna, may be mentioned here. 1 *Salicornaria*, 1 *Cel-laria*, 2 *Scruppocellaria*, 75 *Lepralia*, and 17 *Membranipora* are figured, many allied to, and several identical with, recent species. Denk. Ak. Wien, xxxiii. pp. 141-190, 12 pls.

CHILOSTOMATA.

Menipea arctica (Busk) and *smitti* (Norman) from E. Greenland ; the difference of the former from *Crisia pilosa* (Audouin), and of the latter from *Cellularia ternata* (Ellis), pointed out. Kirchenpauer, Zweite deutsche Nordpolarfahrt, ii. pp. 417 & 418.

Scrupocellaria inermis (Norman) = *Cellularia scabra*, forma *elongata* (Smitt), from E. Greenland ; *id. l. c.* p. 418.

Membranipora lacroixi (Sav.) and *gracilis* (Goldfuss, 1826) = *bifo-veolata* (Heller, 1867) described from miocene specimens by Reuss, *l. c.* pp. 180 & 184, pls. ix. figs. 6-8, x. figs. 5-7.

Lepralia coccinea, *ansata*, and *violacea* (Johnst.) described from miocene specimens and their palæontological synonymy made out ; *id. l. c.* pp. 155, 158, & 163, pl. vi. figs. 11, 12, & 7.

Lepralia smitti, new name for *Escharella legentili*, forma *prototypa* (Smitt), scarcely identical with *Flustra legentili* (Audouin), and found at E. Greenland ; with note on the perforations of the walls in *Lepralia lahdsborowi* (Smitt). Kirchenpauer, *l. c.* p. 420.

Hemeschara contorta, sp. n., from E. Greenland, ? = *Escharella porifera*, forma *cancellata* (Smitt) ; *id. l. c.* p. 422.

Eschara cervicornis (Lam.), from E. Greenland. Note on its variability and doubtful synonyms ; *id. l. c.* p. 424.

Salicornaria farciminoides (Ell.), described from miocene specimens, with palæontological synonymy ; Reuss, *l. c.* pp. 143-146, pl. xii. figs. 3-13.

Cellaria cereoides (Sol. & Ell.), described, with palæontological synonymy ; *id. l. c.* pp. 146-148, pls. xi. figs. 11-15, xii. figs. 1 & 2.

CYCLOSTOMATA.

Hornera lichenoides (L.). Four varieties, *borealis* (Busk), *flabellaris*, *frondiculata* (Lamx.), and *reticulata*, from Eastern Greenland, all connected by intermediate forms, characterized by Kirchenpauer, *l. c.* p. 425.

Discofascigera, new name for *Defrancia* (Bronn, 1835 ; pre-occupied in *Mollusca*, by Millett, 1826) ; Verrill, Am. J. Sci. (5) v. [1873] pp. 101.

Naresia, g. n. ; a transparent stalk from 2 to 3 inches long, with numerous branches at the tip, somewhat similar to *Dictyonema*. *N. cyathus*, Atlantic, in 1525 fathoms. W. Thomson, J. Zool. iii. p. 134.

CTENOSTOMATA.

Hippuraria, g. n. ; stem jointed, nodular, whorls of celliferous tubules arising from the nodes. Zoecia two-celled. May form a new family.

H. egertoni, sp. n., Berehaven, Ireland, parasitic on *Gonoplax angulata*. Busk, P. Z. S. 1874, pp. 29 & 30, pl. v.

Paludicella. On its gemmation, see above, p. 196.

HIPPOCEPIA.

Plumatella repens. Note on its statoblasts by Horsley, Q. J. Micr. Sci. (2) xiv. p. 217.

Pectinatella magnifica (Leidy) ; Leidy, P. Ac. Philad. 1874, p. 139.

Rhabdopleura (Allm.). G. O. Sars recapitulates its structure [see Zool. Rec. ix. p. 184], and maintains that it is an ancient synthetic form, connecting the *Polyzoa* with the *Hydrozoa* ; Q. J. Micr. Sci. (2) xiv. pp. 23-44, pl. i. E. Ray Lankester thinks it more nearly allied to the Molluscan type, and endeavours to point out the analogies between them, regarding the lophophore as corresponding to the foot of the *Mollusca* ; *tom. cit.* pp. 77-81.

CRUSTACEA.

BY

PROF. EDUARD VON MARTENS, M.D., C.M.Z.S.

LIST OF MORE IMPORTANT PUBLICATIONS.

- BOBRÉTZKY, N. Zur Embryologie des *Oniscus murarius*. Z. wiss. Zool. xxiv. pp. 179–203, pls. xxi. & xxii.
- BRADY, G. S. Contributions to the Study of the *Entomostraca*. No. ix. On the *Ostracoda* taken among the Scilly Islands. Ann. N. H. (4) xiii. pp. 114–118, pls. iv. & v.
- BUCHHOLZ, R. Crustaceen, in "Die zweite deutsche Nordpolarfahrt in den Jahren 1869 und 1870, unter Führung des Kapitän Koldewey" (Leipzig: 1874, 8vo), ii. Zoologie, pt. 8, pp. 262–398, with 15 plates.
- DYBOWSKY, B. N. Beiträge zur näheren Kenntniss der in dem Baikalsee vorkommenden niederen Krebse aus der Gruppe der Gammariden. St. Petersburg: 1874, 4to, 188 pp. 14 pls. [Supplementary part of Hor. Ent. Ross.]
- GERSTÄCKER, A. Crustacea, in Bronn's "Klassen und Ordnungen des Thierreichs," v. *Arthropoda*, pts. 17–20, pp. 833–992, pls. xxiv.–xxxi.
- HESSE, M. Mémoire sur des Crustacés rares ou nouveaux des côtes de France. 23^{me} Article: *Pranizes* et *Ancées* nouveaux. Ann. Sci. Nat. (5) xix. art. 8, 29 pp. pls. xxi. & xxii.
- . 24^{me} Article: *Oomère*. Op. cit. xx. art. 5, 17 pp. pl. viii.
- HOFFMANN, C. K. Crustacea in "Recherches sur la faune de Madagascar et de ses dépendences," pt. v. 2^{me} livrn. Leyden: 1874, 8vo, 9 pls.
- KESSLER, K. Die russischen Flusskrebse. Bull. Mosc. xlviii. pp. 343–372.
- KOSSMANN, R. Ueber *Clausidium testudo*. Verh. Ges. Würzb. (2) vii. pp. 280–293, pl. vi.
- KURZ, W. Dodekas neuer Cladoceren nebst einer kurzen Übersicht der Cladoceren-fauna Böhmens. SB. Ak. Wien, lxx. 82 pp. 3 pls.

- KURZ, W. Ueber androgyne Missbildung bei Cladoceren. *Tom. cit.* 7 pp. 1 pl.
- LESSONA, M., & TAPPARONE-CANEFRI, E. C. Nota sulla *Macrochira kæmpferi* e sopra una nuova specie del genere *Dichelaspis*. *Atti Soc. Tor.* ix. 12 pp. 1 pl.
- MACDONALD, J. D. On the anatomy and habits of the genus *Phronima*. *P. R. Soc.* xxii. pp. 154-158, pl. i.
- MARION, A. F. Recherches sur les animaux inférieurs du golfe de Marseille. 2^{me} mémoire: Description des Crustacés Amphipodes parasites des Salpes. *Ann. Sci. Nat.* (6) i. No. 1, pp. 1-19, pls. i. & ii.
- MASON, J. WOOD. On a new Genus and Species of Land Crabs. *Ann. N. H.* (4) xiv. pp. 187-191.
- PACKARD, JUNR., A. S. Synopsis of the fresh-water Phyllopod Crustacea of North America. In Hayden's Annual Report of the U. S. Geol. & Geogr. Survey of the Territories for 1873 [Washington: 1874, 8vo], pp. 613-622, pls. i.-iv.
- This author's paper in 6th Rep. Peab. Acad. 1874, quoted in the 'Synopsis,' has not been seen by the Recorder.
- SARS, G. O. Beskrivelse af syv nye Cumaceer fra Vestindien og det Syd-Atlantiske Ocean. *Sv. Ak. Handl.* xi. No. 5, 30 pp. 6 pls.
- . Om en dimorph udvikling samt generationsvexel hos *Leptodora*. *Ofvers. Dan. Selsk.* 1873, pp. 1-15, pl. i.
- . Om Hummerens postembryonale Udvikling. *Op. cit.* 1874, 27 pp. 2 pls.
- SIEBOLD, C. T. VON. Ueber Parthenogenesis der *Artemia salina*. *SB. bayer Akad.* 1873, pp. 168-196.
- STIMPSON, W. Notes on North American Crustacea in the Museum of the Smithsonian Institution. *Ann. Lyc. N. York*, x. pp. 92-136.
- STUXBERG, A. Karcinologiska lagttagelser. *Cefv. Ak. Förh.* 1873, No. 9 (1874), 23 pp. 1 pl.
- VERRILL, A. E. Results of recent dredging Expeditions on the Coast of New England. Nos. 1-7. Collection of separate prints from *Am. J. Sci.* v. 1873, vi. 1873, and vii. 1874.
- WEISMANN, A. Ueber Bau und Lebenserscheinungen von *Leptodora hyalina*. *Z. wiss. Zool.* xxiv. pp. 349-418, pls. xxxiii.-xxxviii. (also as a separate print, Leipzig: 1874, 70 pp. 6 pls. 8vo.)

A. GERSTÄCKER has continued his valuable treatise on the Crustacea, giving in parts 17-20 an accurate account of the organization and reproduction of his Order *Branchiopoda*, including the *Phyllopoda*, *Cladocera*, and *Ostracoda*, pp. 833-992, illustrated by 7 plates.

EMBRYOLOGY.

The formation of the egg in the Crustacea is reviewed with careful reference to the literature of the subject, and some new observations, by H.

LUDWIG, Arb. Inst. Würzb. pts. v. & vi. pp. 379-401, = Verh. Ges. Würzb. (2) vii. pp. 125-147. The eggs of *Apus* and *Sacculina* are described from personal observations, and figured, pls. xiii. figs. 11 & 12, xiv. figs. 13-16; the author, in opposition to a statement made by Siebold, ascertains by several measurements, that in the former the mass of yolk in the egg when just laid is not greater than when still within the follicle of the ovary. In the *Crustacea*, the egg is always a simple cell, but of large growth. The author also corroborates the opinion of E. van Beneden, Bull. Ac. Belg. (2) xxviii. 1869, xxix. 1870, and chiefly Mém. cour. Ac. Belg. xxxiv. 1870, that two essential parts of the ovary are locally separate, one for the origin of the eggs themselves, the germinal part (Keimstock), and another for the production of the chief mass of the yolk (Dotterstock); the latter is only the lower part of the ovary, in which the more advanced eggs are to be found, but this advance in development is independent of that part of the ovary, and the latter is quite different from what is called by the same name (Dotterstock) in the *Trematoda*. Follicles in the ovary are found only in the order *Decapoda*, and in the genus *Apus*. The elements of the yolk are often of remarkable size in the *Crustacea*, and of various colours. The egg cell is surrounded by a vitelline membrane, and generally also by a secondary envelope secreted by special glands.

Spermatozooids of *Carcinus maenas* and their development described by P. HALLEZ, C. R. lxxix. pp. 243-246; those of *Maia squinado* and *Homarus vulgaris*, by BROCCHI, tom. cit. pp. 855 & 856; of other *Crustacea*, by A. SANDERS, M. Micr. J. xi. pp. 104-109, pls. liv. & lv. (pt.).

A. STUXBERG describes the larval stages of several *Decapods*, most of them observed shortly before hatching, viz.:—*Stenorhynchus rostratus* (L.), *Carcinus maenas* (L.), *Portunus depurator* (L.), *Galatea intermedia* (Lillj.), *Hippolyte varians* (Leach), and *Palaemon squilla* (L.). Cefv. Ak. Förh. 1873, part 9 (issued 1874), 23 pp. 1 pl.

G. O. SÆRS describes the development of the Norwegian lobster, the three stages of which agree fully with those observed by S. Smith in the American lobster [Zool. Rec. x. p. 184]. Overs. Dan. Selsk. 1874, 27 pp. 2 pls.

The embryology of *Astacus fluviatilis* and *Palaemon* sp. is the subject of a careful treatise by N. W. BOBRETZKY (in Russian). Sapisky Kiew Nat. iii. (1873); abstract, JB. Anat. Physiol. ii. (1873) pl. 312-318.

The embryology of *Oniscus murarius*, Cuv. [*asellus*, L.], is described (in Russian) by the same author in the report of the meeting of Russian naturalists at Kasan in 1873, also in Z. wiss. Zool. xxiv. pp. 179-203, pls. xxi. & xxii. The development agrees in many respects with that of the *Decapoda*.

CONTRIBUTIONS TO FAUNAS.

R. BUCHHOLZ has published a very elaborate account of the *Crustacea* found by the second German Arctic Expedition at or near the eastern coast of Greenland, with beautiful plates; they are 55 species, comprising 13 macrurous *Decapods*, 27 *Amphipods*, 3 *Bopyrids*

(no other Isopod), 1 Phyllopod, 8 Copepods, 1 Cirriped, and 3 *Pycnogonidæ*. 26 of them are exclusively peculiar to the Arctic seas, as many occur also on the coast of Norway, 16 on the British coasts, 5 only (*Gammarus locusta*, *Amathilla sabini*, *Harpacticus chelifer*, *Diaptomus castor*, and *Balanus porcatus*) in the Baltic sea.

W. C. MACINTOSH gives a large list of *Crustacea* observed at St. Andrews, with some interesting remarks; Ann. N. H. (4) xiv. pp. 258-274, 337-349.

New British Amphipods by STERRING, *tom. cit.* pp. 10-14, pls. i. & ii. and pp. 111-117, pls. xi. & xii.

Marine *Ostracoda* from the Scilly Islands by BRADY, *op. cit.* xiii. pp. 114-118, pls. iv. & v.

The *Cladocera* observed in Bohemia are the subject of a valuable paper by W. KURZ, SB. Ak. Wien, lxx. 82 pp. 3 pls. The author has observed 56 species (12 new), and gives interesting notes on most of them; he compares this number with that observed in other European countries by specialists, and concludes that a moderate number of species is widely distributed throughout Europe, and these are in every country the most common, and first to be found, but that each country has also its peculiar rare species of more limited distribution.

A. E. VERRILL gives lists of *Crustacea* dredged on the coasts of New England; Am. J. Sci. (3) v. pp. 16 & 101, vi. p. 439, vii. pp. 38, 40, 42, 43, 45, 131, 133, 135, 411, & 502. J. F. WHITEAVES, Gulf of St. Lawrence, *tom. cit.* pp. 212, 215, 217 & 218.

New species of *Decapoda* from the West Indies, Panama, and California, by W. STIMPSON, Ann. Lyc. N. York, x. pp. 92-136 (1872).

C. H. HOFFMANN gives a list of 176 species of *Crustacea Podophthalma* from Madagascar and the Mascarene Islands, with descriptions and figures of several new species.

Australia and Polynesia. Important contributions to the knowledge of the carcinological fauna of these regions are due to the "Museum Godeffroy," Hamburgh, some new genera and a number of new species being described in the Journal, iv. [1873], by A. Milne-Edwards, and a very rich list of Crustaceans offered for sale, with special indication of localities, in the 5th Catalogue (Febr. 1874, pp. 71-84), of that Museum.

WILLEMOËS-SUHM has published very interesting observations on the pelagic and deep-sea fauna made during the expedition of the "Challenger," chiefly concerning *Crustacea*; he gives the following as the chief results:—The deep-sea fauna in the Indian and Australian oceans is nearly the same as in the Atlantic. Gigantic forms are found in the depths, pertaining to families, represented in superficial regions only by genera and species of small size. The Schizopods of the depths are distinguished by the dorsal shield lying loosely on the body as in *Apus*, and often by peculiar modifications of the eyes. The higher families of Decapods are entirely wanting on the shores of the Antarctic Islands. Amphipods and Isopods, the young of which are developed in special sacs or bags borne by the parents, occur in large numbers on those islands, the Echinoderms of which

have the same peculiarity; it would thus appear that the climate is unfavourable to the existence of free swimming larvæ. The pelagic *Crustacea* of the Antarctic seas are chiefly *Euphausia*, *Hyperia*, *Prymno*, and the families *Calanidæ* and *Cypridæ*. The fauna of the warmer parts of the sea reaches as far south as 48°–50° S. latitude. Z. wiss. Zool. xxiv. supplement, pp. ix.–xxiii.

General observations on the results of dredging operations by this expedition south of the equator; Wyville Thomson, Nature, x. p. 142 *et seq.*

Fauna of Lakes.

Lake Baikal. *Gammaridæ* examined and described by B. N. Dybowski, l. c. They amount to no less than 116 species, mostly new.

Lake Superior. Several species peculiar to the lakes of Northern Europe have also been found in this lake, besides *Mysis relicta* and *Pontoporia affinis* [see Zool. Rec. ix. p. 188], also *Daphnia galeata* (G. O. Sars), *D. pellucida* (O. E. Müll.), and *Leptodora hyalina* (Lillj.). S. F. Smith, Am. J. Sci. (3) vii. p. 161.

Fauna of Caves.

The *Crustacea* found in the cave of Falkenstein [see Zool. Rec. x. p. 188] are discussed by S. Fries, J. H. Ver. Württ. xxx. pp. 114–118. *Gammarus puteanus* (Koch) found in Neuchatel in wells; Godet, Bull. Soc. Neuch. ix. p. 153.

DECAPODA.

INACHIDÆ.

Stenorhynchus curvirostris, sp. n., A. Milne-Edwards, J. Mus. Godeffr. iv. (1873) p. 77, Bass' Straits.

Inachoides inornatus, sp. n., *id. ibid.*, Viti Island.

Macrochira kæmpferi (Siebold), from Japan. On its dimensions; Lesona & Tapparone-Canefri, Atti Acc. Tor. ix. p. 1.

MAIIDÆ.

Libinia bidentata, sp. n., A. Milne-Edwards, l. c. p. 77, mouth of the Amoor.

Tiarinia laevis, sp. n., *id. l. c.* p. 78, Upolu Island.

Micropisa crassipes, sp. n., *id. ibid.*, New Holland.

Herbstia pubescens, sp. n., Stimpson, Ann. Lyc. N. York, x. p. 92, W. coast of Mexico.

Herbstiella, g. n.; differs from *Herbstia* in having a strong tooth on the inferior margin of the orbit, between its external angle and the base of the antennæ, and in having three teeth instead of two on the outer side of the basal joint of the antennæ. *Herbstia depressa* (Stimps., 1860), West Indies, and *H. edwardsi* (Bell), Galapagos, belong to this

genus, and *H. camptacantha* and *tumida*, spp. nn., W. coast of Mexico. *Id.* l. c. pp. 93-95.

Eupleurodon, g. n.; allied to *Epialtus*, but with a depressed and uneven carapace, its antero-lateral angles forming strong projecting teeth, directed forward. *E. trifurcatus*, sp. n., Cape St. Lucas, California. *Id.* l. c. p. 98.

Micippoides, g. n.; front consisting only of the two rostral horns, the supra-orbital spine wanting. *M. angustifrons*, sp. n., Upolu, Samoa Islands. A. Milne-Edwards, l. c. p. 78, pl. i. fig. 2.

ACANTHONYCHIDÆ.

Notolopas, g. n.; general appearance of *Acanthonyx*, orbital region as in *Pisa*, post-ocular lobe strong, excavated in front, external antennæ exposed; back with a flattened area on the posterior half, enclosed by a ridge which posteriorly becomes a broad concave lamella, occupying the entire width of the carapace and projecting over its posterior extremity. *N. lamellatus* [-a], sp. n., Panama. Stimpson, l. c. pp. 96 & 97.

Podonema vestita [-tum], sp. n., *id.* l. c. p. 97, Cape St. Lucas, California.

PARTHENOPIDÆ.

Eurynome erosa, sp. n., A. Milne-Edwards, l. c. p. 78, pl. i. fig. 1, Upolu, Samoa Islands.

Lambrus gracilipes and *pugilator*, *id.* l. c. pp. 78 & 79, Upolu; *L. excavatus*, Manzanillo, *hyponcus*, Panama, and *depressiunculus*, Manzanillo; Stimpson, l. c. pp. 99-101: spp. nn.

Solenolambrus arcuatus, sp. n., Panama; Stimpson, l. c. p. 102.

Heterocrypta, g. n.; differs from *Cryptopodia* in wanting a posterior expanse of the carapace and in the existence of a ridge on the pterygostomial region. *Cryptopodia granulata* (Gibbes) and *H. macrobrachia*, sp. n., Panama. *Id.* l. c. p. 105.

CANCRIDÆ.

Actæa consobrina, sp. n., A. Milne-Edwards, l. c. p. 79, Upolu.

Actæa dovii, sp. n., Panama, and note on *A. erosa* (Stimps.); Stimpson, l. c. p. 104.

Liomera variolosa, sp. n., A. Milne-Edwards, l. c. p. 79, Upolu.

Xanthodes xantusi and *insculpta*, spp. nn., Stimpson, l. c. p. 105, Cape St. Lucas, California.

Medæus simplex, sp. n., A. Milne-Edwards, l. c. p. 79, Madagascar and Upolu.

Menippe rumphi (F.) = *nodifrons* (Stimps.), West Indies; Stimpson, l. c. p. 106 [cf. Zool. Rec. ix. p. 190].

Micropanope latimana and *cristimana*, Cape St. Lucas, *caribbæa*, St. Thomas, spp. nn., *id.* l. c. pp. 107 & 108.

Chlorodius occidentalis, sp. n., *id.* l. c. p. 108, Panama and Manzanillo.

Panopeus planissimus (Stimpson, as *Xantho*) from California, *id. l. c.* p. 108.

Cyclozanthus godeffroyi, sp. n., A. Milne-Edwards, *l. c.* p. 80, pl. i. fig. 3, Upolu.

Pilumnus fragifer and *elatus*, spp. nn., *id. l. c.* p. 80, the first, pl. i. fig. 4, from the Indian Seas, the second from Upolu. *P. depressus* and *marginatus*, spp. nn., Stimpson, *l. c.* p. 109, Cape St. Lucas.

Cymo deplanatus[-a], A. Milne-Edwards, *l. c.* p. 81, Upolu.

Rueppellia lata, sp. n., *id. ibid.*, Philippines.

Acidops, g. n.; somewhat allied to *Pilumnus*, orbits destitute of teeth or fissures, eye-peduncles flattened, with an acute anterior edge continuous with that of the margin of the carapace. *A. fimbriatus*, sp. n., Cape St. Lucas. Stimpson, *l. c.* p. 111.

PORTUNIDÆ.

Neptunus madagascariensis, sp. n., Hoffmann, Rech. faun. Madag. v. 2, p. 8, pl. i. figs. 2-4, Nossy-Faly Island, near Madagascar.

Thalamita helleri, sp. n., *id. l. c.* p. 10, pl. i. fig. 5, Madagascar.

Goniosoma dubium, sp. n., *id. l. c.* p. 11, pl. ii. figs. 6-8, Reunion Island.

Achelous transversus, Manzanillo, *acuminatus*, Panama, and *panamensis*, sp. n., Panama; Stimpson, Ann. Lyc. N. York, x. pp. 111 & 112.

ERIPHIIDÆ.

Eriphia smithi (McLeay) distinct from *lavimana* (Latr.); Hoffmann, *l. c.* p. 6, pl. i. fig. 1.

GECARCINIDÆ.

Hylæocarcinus, g. n.; third joint of external maxillipeds partially concealed by the second, exopodite without flagellum; internal sub-orbital lobes separated from the front; tarsi with six rows of spines. *H. humii*, sp. n., Nicobar Islands. Mousson, Ann. N. H. (4) xiv. pp. 187-191. It is remarkable that this species exhibits the same shallow yellow scars on each side of the eye and on other parts of the carapace as *Gecarcinus* and *Pelocarcinus*.

OCYPODIDÆ.

Ocypode ceratophthalma (Pall.) and *cordimana* (Latr.) figured by C. K. Hoffmann, Rech. faun. Madag. v. 2, p. 13, pls. ii. figs. 9-13, iii. figs. 14 & 15.

Gelasimus inversus, sp. n., right hand the largest; *id. l. c.* p. 19, pl. iv. figs. 23-26, Nossy-Faly, Madagascar. *G. marionis* (Desm.) described; *id. l. c.* p. 15, pl. iii. figs. 16-18, an abnormal hand, fig. 22.

Crossotonotus, g. n.; carapace discoidal, front toothed, produced, infra-orbital lobe with a linear notch, basal joint of the outer antenna placed

above the orbital gap, and not jointed to the front, basal joint of the inner antenna situated transversely below the front; maxillipeds ciliated, ischiognath large, with a very lengthened supero-internal angle, merognath very narrow; ambulatory feet compressed; abdomen of the male 7-jointed. Stands between *Ocypode* and *Plagusia*. *C. compressipes*, sp. n., Upolu. A. Milne-Edwards, J. Mus. Godeffr. iv. (1873) pp. 82 & 83.

Scopimera inflata, sp. n., *id. l. c.* p. 83.

Macrophthalmus græffii, sp. n., *id. l. c.* p. 81, pl. ii. fig. 5, Upolu.

Clistostoma tridentatum, sp. n., *id. l. c.* p. 82, Upolu.

GRAPSIDÆ.

Grapsus strigosus (Herbst), *pharaonis* (Latr.), and *maculatus* (M.-E.); Hoffmann, Rech. faun. Madag. v. 2, pp. 20 & 21, pl. v. figs. 31-38.

Heterograpsus spinosus (A. Milne-Edw.), male described; J. Mus. Godeffr. iv. (1873) p. 82.

Pachygrapsus striatus, sp. n., A. Milne-Edwards, *ibid.*, Sandwich Islands and Upolu. *P. socius*, sp. n., Stimpson, Ann. Lyc. N. York, x. p. 114, California, Panama. *P. transversus* (Gibbes, as *Grapsus*) = *Metopograpsus dubius* (Saussure); *id. l. c.* p. 113.

CALAPPIDÆ.

Calappa tuberculata (F.) var.: Hoffmann. *l. c.* p. 25, pl. vi. figs. 39-44, Nossy-Faly, Madagascar.

Matuta distinguenda, sp. n., *id. l. c.* p. 27, pls. vi. figs. 49-52, vii. figs. 53-57, Passandava Bay, Madagascar. *M. victor* (F.) figured for comparison; *ibid.* pl. vi. figs. 45-48.

Osachila acuta, sp. n., Stimpson, Ann. Lyc. N. York, x. p. 114, Panama and Manzanillo.

Pleurophricus, g. n.; near *Orithyia*, lateral edge of the carapace regularly toothed. *P. cristatipes*, sp. n., Australia. A. Milne-Edwards, *l. c.* p. 84, pl. i. p. 6.

LEUCOSIIDÆ.

Merocryptus, g. n.; branchial regions prolonged into cylindrical appendages overlapping the base of the three hinder pairs of ambulatory feet. *M. lambriformis*, sp. n., Upolu. A. Milne-Edwards, *l. c.* p. 85, pl. ii. fig. 1.

Ebalia pulchella, *miliaris* and *spinosus*, spp. nn., *id. l. c.* p. 85, pl. ii. figs. 2, 3, 4; the first from Viti Islands, the two others from Upolu.

Philyra marginata, sp. n., *id. ibid.*, Upolu.

Persephone tuberculata, sp. n., *id. l. c.* p. 86, Bass' Straits.

Phlyxia quadrata and *erosa*, spp. nn., *id. ibid.*, Bass' Straits.

Lithadia pontefera, sp. n., Stimpson, Ann. Lyc. N. York, x. p. 115, Barbados.

Uhlias, g. n.; allied to *Oreophorus*, broadly elliptical, front not pro-

jecting, eyes concealed beneath the orbital margin of the carapace; penultimate joint of the ambulatory feet expanded and dactylus short. *U. ellipticus*, Panama, and *limbatus*, St. Thomas, spp. nn. *Id. l. c.*, pp. 117 & 118.

Speleophorus nodosus (Bell, as *Oreophorus*, M.-E.), female described; *id. l. c.* p. 119, Jamaica.

HIPPIDE.

Remipes barbadensis, sp. n. (already indicated by Petiver), Stimpson, *l. c.* p. 120, Barbados.

PORCELLANIDÆ.

Porcellana spinipes, sp. n., A. Milne-Edwards, *l. c.* p. 86, Upolu.

Petrolisthes eriomerus, sp. n., Stimpson, *l. c.* p. 119, Mendicino, California.

ERYONIDÆ.

Deidamia, g. n. (Willemoës-Suhm, MS.) Wyville Thomson, *Nature*, viii. [1873] pp. 51 & 247. Cephalothorax flattened, with a compressed free lateral margin; a lamellar appendage at base of each of the outer antennæ; swimmerets consisting of 3 joints with 2 palpi; no trace of eyes or eyestalks; 4 pairs or all the ambulatory feet cheliferous. Approaches the fossil *Eryon*. *D. leptodactyla*, p. 51, fig., dredged in the N. Atlantic, 1900 fathoms, and *crucifer*, p. 247, dredged near the Antilles, 450 fathoms. *Deidamia* being pre-occupied by Clemens (*Lepidoptera*, 1859), the name *Willemoesia* is proposed for it; A. R. Grote, *tom. cit.* p. 485. Cf. Z. wiss. Zool. 1874, pp. xxix. & xxxiii., and Thomson, J. Zool. iii. p. 130.

LORICATA.

Palinurus ehrenbergi (Heller), Hoffmann, *Rech. faun. Madag.* v. 2, pp. 30-32, pl. viii. fig. 60, Reunion Island.

Scyllarus nodifer, sp. n., Stimpson, *P. Ac. Chic.* i. [1866] p. 123, and *Ann. Lyc. N. York*, x. p. 123, Florida Keys.

ASTACIDÆ.

The species of fresh-water Crayfishes occurring in the Russian Empire have been examined by K. Kessler, and are arranged by him in the following manner:—

- a. Rostrum with a tooth on each side near the tip; upper flagellum of the inner antennæ scarcely denticulated; males without hooks at the base of the feet, first pair of abdominal feet one-jointed. 1. *Astacus leptodactylus* (Eschscholtz) widely distributed in most rivers tributary to the Black, Caspian, and White Seas, also in the Caspian Sea itself; *A. angulosus* (Rathke) is a

variety of it. 2. *A. pachypus* (Rathke, 1837) = *caspius* (Eichwald, 1838), mouths of the rivers Bug, Dniester and Volga. 3. *A. fluviatilis* (Rondelet) in the rivers tributary to the Baltic.

b. Rostrum without lateral tooth near the tip; upper flagellum of the inner antennæ distinctly serrated; males with a hook at the third joint of the second and third pairs of thoracic feet, first pair of abdominal feet two-jointed, forming a closed tube at the tip.

4. *A. dauricus* (Pall.), upper course of the Amoor and its tributaries. 5. *A. schrencki*, sp. n., lower course of the Amoor.

It is probable that *A. leptodactylus* has been supplanted in the rivers tributary to the Baltic, where it still lives at some localities, by the stronger-handed *A. fluviatilis*, and this may in future occur in the Dnieper, where *A. fluviatilis* is becoming acclimatized. A Crayfish from Hakodadi, probably *A. japonicus* (De Haan), is described. Bull. Mosc. xlviii. pp. 343-372.

Cambarus sp.: a few notes on the Crayfish at Milwaukee, Wisconsin (some of them red during life), by T. A. Bruhin, Zool. Gart. xv. pp. 396 & 397.

Homarus vulgaris; on its development, see above, p. 201.

Nephropsis stewarti (Mason; see Zool. Rec. x. p. 189) copied by Milne-Edwards, Ann. Sci. Nat. (5) xix. art. 7, pl. xx. figs. 1-3.

Astacus zaleucus, sp. n., from the West Indian Seas, in a depth of 450 fathoms, without eyes, (Willemoës-Suhm, MS.) Wyville Thomson, Nature, viii. [1873] p. 246, with woodcut, and J. Zool. iii. p. 130. Milne-Edwards thinks it to be a new genus of *Thalassinidæ*; Ann. Sci. Nat. (5) xix. art. 7, pl. xx. fig. 4, copy.

THALASSINIDÆ.

Azia serratifrons, sp. n., A. Milne-Edwards, J. Mus. Godeffr. iv. (1873) p. 87, pl. ii. fig. 6, Sandwich and Samoa Islands.

Glypturus, g. n. Caudal lamellæ deeply sculptured, outer lamella of the lateral appendages of the tail composed of two pieces soldered together, terminal median segment very small. *G. acanthochirus*, sp. n., Florida Keys. Stimpson, P. Ac. Chic. i. [1866] p. 46, and Ann. N. Lyc. N. York, x. p. 121.

Callichirus, g. n. Carpus and hand of the greater cheliped very long; inner lamellæ of the lateral appendages of the tail almost styliform; terminal median segment short and broad, contracted at the base, emarginated at the extremity. Type, *Callianassa major* (Say), Southern States and Florida. *Id.* l. c. p. 47, and Ann. Lyc. N. York, x. p. 122.

ALPHEIDÆ.

Alpheus latifrons, sp. n., A. Milne-Edwards, l. c. p. 87, Upolu.

PALEMONIDÆ.

Palaemon mayottensis, Mayotte and Nossy-Faly, near Madagascar,

alphonsianus [? = *idæ* (Heller)], *reunionensis* and *longimanus*, Reunion, *madagascariensis* and *parvus*, Nossy-Faly, spp. nn., Hoffmann, Rech. faun. Madag. v. 2, pp. 32-35, pls. vii. figs. 58 & 59, ix. figs. 61-69.

Leander palæmoniformis, sp. n., Stimpson, Ann. Lyc. N. York, x. p. 130, fresh-water streams of Barbadoes and Trinidad.

Palæmonetes (Heller) = *Palæmonopsis* (Stimpson, MS.). To this genus belong *Palæmon vulgaris* (Say), brackish water from Massachusetts to South Carolina, *P. carolinus*, sp. n., harbour of Charleston and Beaufort, and *P. exilipes*, sp. n., freshwater in South Carolina; *id. l. c.* pp. 129 & 130.

Hippolyte incerta and *panschi*, spp. nn., Buchholz, Zweite deutsche Nordpolarfahrt, ii. pp. 272 & 277, E. Greenland, the latter figured, pl. i. fig. 1, with descriptive notes on some other Arctic species. *H. picta*, Monterey, and *vibrans*, Massachusetts, spp. nn., with notes on other North American species; Stimpson, *l. c.* pp. 125-127.

Virbius pleuracanthus, sp. n., Stimpson, *l. c.* p. 127, coast of Virginia and New Jersey.

Pandalus. Some new species from Naples have been described by A. Costa, 1871, in a paper which the Recorder has not yet seen. *P. gurneyi*, sp. n., Stimpson, *l. c.* p. 128, Monterey.

Hippolymata californica, sp. n., Stimpson, P. Ac. Chic. i. [1866] p. 123, and Ann. Lyc. N. York, p. 123, San Diego, California.

Rhynchocyclus parvulus, sp. n., *id. l. c.* p. 124, Texas.

PENEIDÆ.

A new genus, characterized by the bladder-like expansion of the lateral appendages of the gnathopods, serving as a parachute, observed in the tropical part of the Pacific by Willemoës-Suhm, Z. wiss. Zool. xxiv. p. xxxiii.

Peneus pubescens, St. Thomas, *stylirostris*, Panama, and *constrictus*, Charleston, spp. nn., Stimpson, Ann. Lyc. N. York, x. pp. 133-136, with notes on *P. brasiliensis* (Latr.) and *setiferus* (L.) = *fluviatilis* (Say).

Sicyonia lævigata, sp. n., Charleston, and *brevirostris*, new name for *cristata* (Saussure, nec De Haan); *id. l. c.* pp. 131 & 132.

Pasiphae glacialis, sp. n., Buchholz, Zweite deutsche Nordpolarfahrt, ii. p. 279, pl. i. fig. 2, Arctic Sea, near 74° N. latitude.

CUMACEA.

Diastylis antillensis (G. O. Sars, 1872), Anguilla Island, W. Indies, and *fimbriata*, sp. n., S. Atlantic, 23° S. lat., fully described; G. O. Sars, Sv. Ak. Handl. xi. No. 5, pp. 4-11, pl. i. figs. 1-3, and pl. ii.

Leucon anomalus (G. O. Sars, 1871), from St. Martin's Island, West Indies, 200-300 fathoms, fully described; *id. l. c.* pp. 11-13, pl. iii. figs. 10-13.

Campylaspis pulchella (G. O. Sars, 1872), Anguilla Island; *id. l. c.* pp. 14-16, pl. i. figs. 14-16.

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Stephanomma goesi (G. O. Sars, 1872), St. Martin's Island; *id. l. c.* pp. 16-21, pl. iv. figs. 17-23.

Leptostylis manca, sp. n., distinguished by the permanent want of the last pair of feet, which is only temporary in the other *Cumacea*. Southern Atlantic, near the mouth of the La Plata, 62 fathoms. *Id. l. c.* pp. 22-24, pl. v. figs. 24-28.

Leptocuma, g. n.; near *Cuma*, but with five free segments behind the dorsal shield, the foremost very short, skin smooth and very thin, eye indistinct, &c.; male unknown. *L. kinbergi*, sp. n., S. Atlantic, near the mouth of the La Plata, 50 fathoms. *Id. l. c.* pp. 24-28, pl. vi. figs. 29-33.

STOMATOPODA.

MYSIDÆ.

Gnathophausia, g. n.; eyes large, an accessory one on the second pair of maxillæ. *G. gigas* and *zoea*, spp. nn., W. Thomson, J. Zool. iii. p. 133, and Willemoës-Suhm, Z. wiss. Zool. xxiv. p. xxii. (*Gnatheuphausia*), Southern Atlantic, 1000-2000 fathoms.

SQUILLIDÆ.

Squilla schmeltzi, sp. n., A. Milne-Edwards, J. Mus. Godeffr. iv. (1873), p. 87, pl. ii. fig. 7, Upolu.

AMPHIPODA.

R. BUCHHOLZ makes some general observations on the structure of this order, chiefly on the peculiar appendages of the antennæ in the males; he points out that these are generally formed of three cup-like pieces, placed somewhat obliquely above each other, and suggests that they may serve as prehensile or clapping organs. *Zweite deutsche Nordpolarfahrt*, ii. pp. 294-298.

S. I. SMITH has found that a large portion of the third and fourth pairs of thoracic legs is filled with a peculiar opaque glandular substance in some tube-building *Amphipoda*, and occupied by muscles in those species which do not build tubes; the greater part of this gland is situated in the basal joint in the genera *Xenoclea*, *Amphithoe*, and *Cerapus*, and in the basal and meral joints in *Ptilochirus*, *Ampelisca*, and *Byblis*. The terminal joint of these legs is truncated at the tip and tubular; and there can be no doubt that these are the glands which secrete the cement with which the tubes are built. *Am. J. Sci.* (3) vii. p. 601 and *Ann. N. H.* (4) xiv. p. 240.

ORCHESTIIDÆ.

Hyalella, g. n., S. I. Smith, in Hayden's Annual Report of the U. S. Geol. and Geogr. Survey of the Territories for 1873 [Washington: 1874; also separately in Reports of the Zoological Collections, &c.,

1875, same paging], p. 609. Allied to *Hyale*: no comparative differential characters given. *H. dentata*, *ibid.*, pl. i. figs. 3-6, various N. American States, and *inermis*, p. 609, pl. i. figs. 1 & 2, Colorado, *id. l. c.*: spp. nn.

GAMMARIDÆ.

General remarks on this family by Buchholz, *l. c.* pp. 299 & 300.

Anonyx lagena, *littoralis*, and *plautus* (Kröyer). Descriptive notes from E. Greenland specimens; *id. l. c.* pp. 300-304.

Callisoma branickii, sp. n., Wrzesniowski, Ann. N. H. (4) xiv. p. 15, Nice.

Syrrhoe crenulata (Goës) from E. Greenland; Buchholz, *l. c.* p. 304.

Pardaliscia. Description of its buccal organs, and *P. cuspidata* (Kröyer) from Shannon Island, E. Greenland, completely described; *id. l. c.* pp. 305-312, pls. i. fig. 3, ii. fig. 1.

Lillieborgia normani, sp. n., Sterring, Ann. N. H. (4) xiv. p. 10, pl. i. fig. 1, Salcombe Harbour.

Eusirus cuspidatus (Kröyer), from E. Greenland, described by Buchholz, *l. c.* pp. 313-316, pl. iii. fig. 2.

Amphithonotus aculeatus (Lepechin), E. Greenland, 3 and 30 fathoms deep; *id. l. c.* pp. 316-320, pl. iv.

Tritopsis (Böck). Buchholz distinguishes this genus from the preceding by the want of the rostrum and peculiar transverse shape of the eye. *T. fragilis* (Goës), from E. Greenland, carefully described. *l. c.* pp. 320-324, pl. iii. fig. 1.

Edicerus borealis (Böck) = *affinis* (Goës), and *Æ. lynceus* (Sars) = *propinquus* (Goës), from E. Greenland, the first fully, the latter comparatively described; *id. l. c.* pp. 325-333, pls. v., & vii. fig. 2.

A new sub-family, *Pleustinae*, proposed for *Pleustes* (Sp. Bate) con-founded by Böck with *Paramphithoe*, and the following new genus, on account of the general shape of the body, the want of the masticatory tubercle in the mandible, and the broad hatchet-like form of its tooth-process; *id. l. c.* pp. 333 & 334. *Pleustes panoplus* (Kröyer) from E. Greenland, described; *id. l. c.* pp. 334-336, pl. vii.

Parapleustes, g. n.; differs from *Pleustes* in the small size of the rostrum, the equal form of the mandibles on both sides, the short, broad, deeply-notched upper lip, and the want of a keel on the back. *P. gracilis*, sp. n., ? = *Amphithopsis glaber* (Böck), and *Paramphithoe exigua* (Goës), E. Greenland. *Id. l. c.* pp. 337-342, pl. vii. fig. 1.

Vertumnus serratus (F.) from E. Greenland; some notes on it. *Id. l. c.* p. 342.

Iphimedia eblanæ, var. n.; Sterring, Ann. N. H. (4) xiv. p. 14, pl. ii. fig. 4, Torbay.

Atylus carinatus (F.), common at E. Greenland, 10-110 fathoms, fully described; *id. l. c.* pp. 357-361, pl. x.

Calliopius bidentatus (Norman) described by MacIntosh, Ann. N. H. (4) xiv. p. 268.

Acanthozone hystrix (Owen) = *cuspidata* (Lepechin), from E. Greenland, 30 fathoms, described; Buchholz, *l. c.* pp. 362-365, pl. xi.

Paramphithoe (Bruzelius). This generic name is employed for a division corresponding to the genera *Pontogenia*, *Halirages*, and some others of Böck, and contains the typical species of Bruzelius; *P. inermis* (Kröyer), *fulvicincta* (Sars), and *megalops*, sp. n., described, the last figured, all from E. Greenland, generally in shallow water. *Id. l. c.* pp. 365-375, pl. xii.

Gammarus locusta (L.) = *arcticus* (Scoresby) = *boreus* (Sabine) = *sitchensis* (Brandt), the commonest species on the east coast of Greenland, as well as in the Arctic Sea between packed ice. *Id. l. c.* pp. 343-345.

Gammarus lacustris (Smith, 1871) re-named *lymnæus* [limn-], re-described and figured from Colorado; S. I. Smith, in Hayden's Report (*suprà*), p. 609, pl. ii. figs. 13 & 14. *G. robustus*, sp. n., *id. l. c.* p. 610, pl. ii. figs. 7-12, Utah.

The following new species of *Gammarus* from Lake Baikal are described by B. N. Dybowsky, Beiträge, &c. :—

a. Appendage of the flagellum bi- or multi-articulated.

G. flori, with var. *albula*, p. 52, *calcaratus*, p. 54, pl. vii. fig. 4, *margaritaceus*, p. 56, *kietlinskii*, p. 57, pl. i. fig. 1, *stanislavi*, p. 58, *testaceus*, p. 60, *sophiæ*, p. 61, *fuscus*, p. 63, pl. v. fig. 2, *murinus*, p. 64, pl. v. fig. 1, *aheneus*, p. 65, pl. vii. fig. 2, *lividus*, p. 68, pl. vi. fig. 1, *hyacinthinus*, p. 70, *albinus*, p. 71, pl. ix. fig. 2, *flavus*, p. 72, pl. ix. fig. 1, *carneolus*, p. 73, *amethystinus*, p. 74, pl. ix. fig. 6, *violaceus*, p. 75, pl. x. fig. 3, *toxophthalmus*, p. 77, *ibex*, p. 78, *longicornis*, with var. *polyarthrus*, p. 79, *parvezii*, p. 81, pl. x. fig. 2, *vittatus*, p. 83, *petersi*, p. 83, pl. x. fig. 3, *leptocerus*, p. 85, p. viii. fig. 2, with var. *nematocerus*, pl. viii. fig. 3, *sarmatus*, p. 86, pls. i. fig. 2, viii. fig. 4, *capreolus*, p. 87, pl. ix. fig. 1, *ussolzevii*, p. 89, pl. ix. fig. 2, with var. *abyssorum*, *stenophthalmus*, p. 90, *schamanensis*, p. 91, *cyaneus*, p. 22, *czerskii*, p. 94, pls. i. fig. 2, iii. fig. 8, *viridis*, p. 95, pl. vi. fig. 2, with var. *canus*, pls. v. fig. 3, iv. fig. 4, and var. *olivaceus*, *saphirinus*, p. 98, *capellus*, p. 100, *sophianosii*, p. 101, pl. x. fig. 4, with var. *scirtes*, pl. xi. fig. 2, *bifasciatus*, p. 102, p. xii. fig. 6, *pictus*, p. 103, pl. xii. figs. 3 & 2, *orchestes*, p. 104, *talitrus*, p. 105, pl. xi. fig. 3, *araneolus*, with var. *5-fasciatus* and *ephippiatus*, p. 106, pl. xi. figs. 3, 7, & 8, *gerstæckeri*, p. 108, pl. xiv. fig. 5, *ignotus*, p. 109, pl. iv. fig. 3, *branchialis*, p. 110, pl. xiv. fig. 4, within the gill-cavity of other species, *strauchi*, p. 112, pl. xii. fig. 4, *carpenteri*, p. 113, pl. xiii. fig. 2, *cinnamomeus*, p. 114, pl. vii. fig. 3, *rhodophthalmus*, p. 116, pl. xiv. fig. 10, with var. *microphthalmus*, *pulchellus*, p. 118, pl. v. fig. 4, *seidlitzii*, p. 119, pl. v. fig. 5, *wagii*, p. 121, pl. i. fig. 4, *cabanisi*, p. 122, pl. xiii. fig. 5, *zienkoviczii*, p. 124, pl. iii. fig. 5, *reissneri*, p. 126, pls. iii. fig. 1, iv. fig. 7, *grubii*, p. 132, pl. i. fig. 5, *kessleri*, p. 133, pl. i. fig. 7, *brandti*, p. 136, pl. xiv. fig. 1, *loveni*, p. 137, pl. xiii. fig. 2, *borowskii*, p. 139, pl. ii. fig. 6, with var. *dichrous* and *abyssalis*, *lagowskii*, p. 140, pl. ii. fig. 8, *puzyllii*, p. 141, pl. iii. fig. 4, *godlewskii*, p. 143, pl. i. fig. 4, with var. *victori*, *armatus*, p. 146, pl. xii.

fig. 1, *parasiticus*, p. 147, pl. iii. fig. 3, living within *Spongia baicalensis* (Pall.), *radoszkowskii*, p. 149, pl. xiii. fig. 3, *grewingkii*, p. 150, pl. ii. fig. 4, *reicherti*, p. 152, pl. xiii. fig. 4, and *solskii*, p. 153, pl. iii. fig. 2.

b. Appendage of the flagellum uni-articulate :—

G. czjrnianskii, p. 153, pl. ix. fig. 5, *asper*, p. 155, pl. xiii. fig. 1, *taczanowskii*, p. 156, pl. xiv. fig. 9, *latior*, p. 158, pl. iv. fig. 6, *latus*, p. 159, pl. iv. fig. 5, *tuberculatus*, p. 161, *morawitzi*, p. 163, *smaragdinus*, p. 164, pl. xi. fig. 6, with var. *intermedius*, *zebra*, p. 166, pl. xiv. fig. 7, *littoralis*, p. 168, pl. xiv. fig. 2, *inflatus*, p. 169, pl. xii. fig. 4, *pullus*, p. 170, pl. xi. fig. 4, *talitroides*, p. 171, pl. xiv. fig. 5, *fixseni*, p. 172, *rugosus*, p. 174, pl. xiv. fig. 8, *puella*, p. 175, *glaber*, p. 176, pl. xiv. fig. 6, *vortex*, p. 178, pl. ix. fig. 4, *wahli*, p. 179, with var. *platycerus*, *kluki*, p. 181, *pachytus*, p. 182, with var. *dilatatus*, and *perla*, p. 184.

These new species, and several already named by Pallas & Gerstfeldt, are exactly described, and important structural differences between them pointed out; but, as the author has not had access to the more recent publications on the *Gammaridæ*, he has been compelled to refer them all to the genus *Gammarus*. *G. cancelloides* var. *europæus* (Kessler), from Lake Onega, in Russia, differs from *cancelloides* (Gerst.), and is here described as *G. kessleri* var. *europæus*, p. 133.

Constantia, g. n. Both pairs of antennæ transformed into organs of locomotion, being somewhat flattened, the bristles arranged somewhat like a plume, and wanting all organs of specific sensation. *C. branickii*, sp. n., with var. *alexandri*, id. l. c. pp. 50 & 186, pl. iii. figs. 6 & 7, Lake Baikal.

[*Niphargus*] *Gammarus puteanus* (Koch), found at Neuchatel in wells, 32 mm. long, without the antennæ, which reach a length of 15 mm. P. Godet, Bull. Soc. Neuch. ix. pp. 153–155, woodcut.

Amathilla sabini (Leach) and *pinguis* (Krøyer), from E. Greenland, fully described by Buchholz, l. c. pp. 346–356, pls. viii. figs. 1 & 2, ix. figs. 1 & 2. *A. heuglini*, sp. n., id. l. c. p. 345, note, Spitzbergen.

Ampelisca eschrichtii (Krøyer) = *ingens* (Stimps.), from E. Greenland, 10 fathoms, described; id. l. c. pp. 375–377, pl. xiii. fig. 1.

Microtopotus maculatus (Norman) described by Sterring, Ann. N. H. (4) xiv. p. 12, pl. xii. fig. 5.

Microdeutopus versiculatus, sp. n., ♂, id. *ibid.* pl. i. fig. 2, Salcombe Harbour.

Gammarella normani (Sp. Bate & Westw.) = *brevicaudata* (Norm.), ♀; id. l. c. p. 13, pl. ii. fig. 3.

Amphithoe cuniculus, sp. n., Torquay, and *rubricata* (Mont.), described; id. l. c. pp. 112 & 113, pl. xi. figs. 1 & 2.

Synamphithoe gammaroides (Sp. Bate, as *Amphithoe*) and *conformata* (Sp. Bate) described; id. l. c. pp. 114 & 116, pls. xi. fig. 3, xii. figs. 3 & 4.

Podocerus anguipes (Krøyer), common at E. Greenland, fully described by Buchholz, l. c. p. 578, pls. xiii. fig. 2, & 7, xiv.

HYPERIIDÆ.

Vibilia jeangerardi (Lucas, 1849) ? = *speciosa* (Costa, 1853) ? = *mediterranea* (Claus, 1872), living parasitically within *Salpa maxima* (Forskal) and *democratica* (Forskal), in the Mediterranean, exactly described and figured by A. F. Marion, Ann. Sci. Nat. (6) i. pp. 5-11, pls. i. & xix.

PHRONIMIDÆ.

Phronima. Habits and anatomy observed by J. D. Macdonald, P. R. Soc. xxii. pp. 154-158, with a plate; he states that the young are found within the well-known barrel-like envelope of the adult animal.

Themisto libellula (Mandt), very numerous on the surface of the Arctic Sea, near Greenland, between the packed ice, fully described by Buchholz, l. c. pp. 385-387, pl. xv. fig. 1.

Thaum[at]ops pellucida (Will.-Suhm) [see Zool. Rec. x. p. 189], fully described by Willemoës-Suhm, P. R. Soc. xxi. [1873] pp. 206-208, and Phil. Tr. clxiii. [1873] pp. 629-638, pls. xlix. & l. It is *Cystosoma neptuni* (Guérin); *id.* Nature, ix. p. 182.

TYPHIDÆ.

Lycæa (Dana). This genus proved to come very near *Thyropus* (Dana) = *Typhis* (Risso), by *L. pulex*, sp. n., found within the respiratory cavity of *Salpa maxima* (Forskal), near Marseilles. In this animal, young specimens distinctly exhibit two pairs of antennæ, the upper, consisting of five joints, persistent, the under lost in the full-grown specimens; whereas it seems that in *Lycæa ochracea* (Dana) the upper pair are lost. Marion, Ann. Sci. Nat. (6) i. pp. 13-19, pl. ii.

ISOPODA.

PRANIZIDÆ.

Anceus. Hesse has observed that most of the species, in their larval state (*Praniza*), live parasitically on fishes, but are difficult to be found, as they leave the fish as soon as it is caught; he describes *A. balani*, *cotti-bubali*, *unciferus*, *platyrhynchus*, and *scombri*, spp. nn., all from the coast of Brittany, most of them observed in their different stages. Ann. Sci. Nat. (5) xix. 29 pp. pls. xxi. & xxii. *A. surmuleti* (Hesse, 1864) is also figured.

ARCTURIDÆ.

Arcturus danmoniensis, [rectius *dommoniensis*, *dommucensis*, or the modern *devoniensis*] sp. n., Sterring, Ann. N. H. (5) xiii. p. 201, pl. xv. Devonshire.

IDOTHEIDÆ.

Idothea rugulosa, sp. n., Buchholz, Zweite deutsche Nordpolarfahrt, ii. p. 285, note, Spitzbergen.

ASELLIDÆ.

Asellus, sp. n., described, without name, by Hilgendorf, MT. Ges. Ostas. v. p. 39, Yokohama.

Asellopsis, g. n.; distinguished from *Asellus* by the want of mandibular palpi, and by the third joint of the peduncle of the antennulæ being small and short, similar to those of the flagellum. Type, *Asellus tenax* (Smith), from Lake Superior. O. Harger, Am. J. Sci. (3) vii. pp. 601 & 602, and Ann. N. H. (4) xiv. p. 168.

CYMOTHOIDÆ.

Serolis bromleyana, sp. n., found in the Antarctic Sea during the expedition of the "Challenger;" Willemoës-Suhm, Z. wiss. Zool. 1874, p. xxvi.

BOPYRIDÆ.

Leptophryxus, g. n.; male like that of *Phryxus*, female with rudimentary antennæ, the segments of the body only distinct in the middle of the back, indistinct on the sides, 5 pair of thoracic feet, all very near the head, the last two segments of the thorax covered by large plates bearing the eggs. Abdomen small, conical, with traces of 5-6 segmental lines above, the foremost with smaller square plates. *L. mysidis*, sp. n., on *Mysis oculata* (F.), Sabine Island, E. Greenland. Buchholz, l. c. pp. 287-294, pl. ii. fig. 2, larval stage, fig 2 d.

Gyge hippolytes (Kröy.), descriptive notes; *id. l. c.* p. 286.

Cryptoniscus larvaformis [larvif-], sp. n., male in the ovigerous cavity, female fixed to the base of the peduncle, of *Sacculina*; Northern Coast of France. Giard, C. R. lxxix. pp. 241-243, and Ann. N. H. (4) xiv. pp. 386-388.

PHYLLOPODA.

A. S. PACKARD, Jr., in Hayden's Ann. Rep. U. S. Survey, 1873 [*suprà*, p. 210], pp. 613-622, pls. i.-iv., gives a 'Synopsis of the fresh-water Phyllopod Crustacea of North America' (north of Mexico), with a general outline of the structure, habits, affinities, and geological distribution of the group, and especial notice of the instances of parthenogenesis recorded in it. The Nauplius of *Branchipus* (2 a) and of *Apus* (2 b) are figured, with *Sida* (*Cladocera*), fig. 1, for comparison, pl. i. Males of *Apus lucasani* from Kansas are queried as properly referable to *A. æqualis*, with which they occur; no *Apus* has been found east of the Mississippi or in British Territory, and no *Branchipus* in the Pacific States; and a new *Estheria* bears out the analogy of the Pacific coast fauna to that of Europe. The following are briefly described:—ESTHERIIDÆ; *Limnetis* (pl. ii. fig. 3), 2 species; *Limnadia americana* (Morse), pl. ii. fig. 4, *L. (Eulimnadia)*, apparently subg. n.) *agassizi* (sp. n., Packard, 6th Rep. Peab. Acad. 1874) p. 618, pl. ii. fig. 5, Massachusetts, and *L. (E.) texana* (Pack.); *Limnadella kitei* (Gir.) = *coriacea* (Hald.); *Estheria californica* (sp. n., Packard, l. c.), p. 618, pl. ii.

fig. 6, California, *clarki* (sp. n., *id. l. c.*), p. 619, pl. iii. fig. 7, Ohio, &c., and 4 known species, including *belfragii* (Pack.), pl. iii. fig. 8. APODIDÆ: *Lepidurus glacialis* (Kröy.), pl. iii. fig. 9; *Apus æqualis* (Pack.), pl. iii. fig. 10, and 3 other known species (*A. obtusatus*, James, ? = *longicaudatus*, Lec.). BRANCHIPODIDÆ: *Artomia gracilis* (Verr.), pl. iv. fig. 11, and 2 other species; *Branchinecta arctica* and *grænlandica* (Verr.) and *coloradensis* (Pack.), ♂ & ♀, pl. iv. fig. 12, all possibly one species; *Eubbranchipus*, 1 species, and *Streptocephalus texanus* (Pack.), pl. iv. fig. 13, ♂.

Nebalia bipes (Fabr.), from E. Greenland, ? = *N. geoffroyi* (M. E.); Buchholz, *l. c.* pp. 388 & 389.

Apus sp., in Tibetan salt lakes; Schlagintweit, Reisen in Hochasien, ii. (1872) p. 218.

Lepidurus productus (Bosc.). Notes on its habits and development, the latter requiring shorter time (about six months) than that of *Apus cancriformis*; Brauer, SB. Ak. Wien, lix. pp. 130-141, with 2 pls.

Artemia salina (L.). C. T. v. Siebold, from breeding experiments, states that parthenogenesis occurs in this species. The animal is sometimes viviparous, sometimes oviparous, and there are two sorts of eggs, one provided with a firm shell secreted in the ovisac, which can resist drying for a longer time, and the other only provided with a very thin pellucid envelope, and hatched within the ovisac. SB. bayer. Ak. 1873, pp. 168-196.

CLADOCERA.

Laterally hermaphrodite individuals of *Daphnia pulex* (L.) and *schæfferi* (Baird), and *Alona quadrangularis* (Müll.), described by W. Kurz, SB. Ak. Wien, lxx. pp. 1-7, pl. i. The author observes that the males of the *Cladocera* make their appearance not only in autumn, but also at other seasons, when circumstances (such as fouling or drying up the water) occur likely to endanger the life of the females.

DAPHNIIDÆ.

Moina (Baird) is intermediate between the *Daphniinæ* and *Sididæ*: its *vas deferens* opens outwards, not into the intestine. *M. micrura*, sp. n., Kuttnerberg, Bohemia. Kurz, *op. cit.* lxx. pp. 5-9, pl. i. fig. 1.

Daphnia. 8 Bohemian species comparatively characterized, including *D. vitrea*, *apicata*, and *obtusa*, spp. nn., *galatea* (Sars), and *psittacea* (Baird); *id. l. c.* pp. 10-19, pl. i. figs. 2, 3-5, 6-7, & 10.

Ceriodaphnia reticulata (Jurine) and *rotunda* (Straus) described, the latter figured; *id. l. c.* pp. 20 & 21, pl. i. fig. 12.

Macrothrix tenuicornis, sp. n., described comparatively with *M. laticornis* (Jurine), *id. l. c.* pp. 25-28, pl. iii. fig. 1, Bohemia.

Ilyocryptus sordidus (Lievin), notes; *id. l. c.* pp. 28 & 29.

Leptodora hyalina (Lilljeb.). The structure, histology, and biology of this interesting genus are fully described by AUG. WEISSMANN, who considers it to be one of the most primitive forms of its family. It has been observed swimming freely in the Lake of Constance and in the

Lago Maggiore. Observations on its breeding and development could not be made. Z. wiss. Zool. xxiv. pp. 349-418, pls. xxxiii.-xxxviii. [*cf.* Zool. Rec. x. p. 193].

G. O. Sars has observed the development of this animal from the summer eggs without any metamorphosis, from the winter eggs by a remarkable metamorphosis, the larva being provided only with 3 pairs of limbs, first and second pairs of antennæ, the latter already used as oars, and long mandibular palpi; no compound eye; only few traces of internal organs. The animals developed in this manner are always recognizable by the single simple eye between the compound eyes. Overs. Dans. Selsk. 1873, 15 pp. 1 pl.

LYNCEIDÆ.

A synoptical view of the known genera given, and a new sub-family *Eurycercinae* proposed for the only genus *Eurycercus*, by Kurz, SB. Ak. Wien, lxx. pp. 30-34.

Camptocercus latirostris, sp. n., *id. l. c.* p. 35, pl. ii. figs. 9 & 10, Bohemia.

Alonopsis latissima, sp. n., *id. l. c.* p. 40, pl. ii. figs. 13-15, Bohemia.

Alona. A synoptical table of the known species given, and *A. parvula*, *tuberculata*, *elegans*, *coronata*, spp. nn., *lineata* (Fischer) and *oblonga* (P. E. Müller), described; *id. l. c.* pp. 41-50, the new species figured, pl. ii. figs. 8, 3, 1, & 4-6.

Leydigia, g. n.; near *Alona*, anal furrow provided on each side with numerous transverse rows of long spines, male with a flagellum on the first pair of antennæ. *Lynceus quadrangularis* (Leydig) and *acanthocercoides* (Fischer), the former described. *Id. l. c.* pp. 51-53.

Graptoleberis testudinaria (Fischer), male and female described; *id. l. c.* pp. 54-56, pl. ii. figs. 11 & 12.

Alonella. A synoptical table of the known species given, and *A. exigua* (Lillj.), *rostrata* (Koch), and *pygmaea* (Sars) = *transversa* (Schödler), described; *id. l. c.* pp. 56-61, pl. iii. fig. 6, pl. ii. fig. 7, & pl. iii. fig. 7.

Peracantha truncata (Müll.) described; *id. l. c.* pp. 62 & 63.

Pleuroxus. A synoptical table of the known species given, and *P. hastatus* (Sars), *trigonellus* (Müll.), *aduncus* (Jurine), and *glaber* (Schödl.), described; *id. l. c.* pp. 64-69, the two former figured, pl. iii. figs. 3, 4, & 2, 5.

Chydorus sphericus (Müll.). Ephippium, males and copulation described; *id. l. c.* pp. 71 & 72, pl. iii. figs. 9 & 10. *C. ovalis*, sp. n., *id. l. c.* p. 73, pl. iii. fig. 11, Bohemia. *C. globosus* (Baird) described; *id. l. c.* pp. 74 & 75, pl. iii. fig. 8.

OSTRACODA.

CYTHERIDÆ.

Xestoleberis labiata, sp. n., Brady, Ann. N. H. (4) xiii. p. 116, pl. iv. figs. 8-15, Scilly Islands.

Cytherura fulva, sp. n., and *sarsi* (Brady), *id. l. c.* pp. 116 & 117, pl. iv. figs. 1-5, & 6, 7, Scilly Islands.

Cytherideis subulata, var. n. *fasciata*, *id. l. c.* p. 117, pl. v. figs. 1-5, Scilly Islands.

Paradoxostoma cuneatum, sp. n., *id. ibid.* figs. 6 & 7, Scilly Islands.

Darwinella, new name for *Polycheles* (Brady, 1870, *nec* Heller, 1862; Zool. Rec. vii. p. 201) [*Darwinella* also is pre-occupied in the sponges by F. Müller, 1865]. A full description of it is given, and the conclusion drawn, that this genus is intermediate between the two families, *Cyprididae* and *Cytheridae*, though more nearly approaching the latter. Brady, Ann. N. H. (4) xiii. p. 117.

COPEPODA.

R. KOSSMANN, Verh. Ges. Würzb. (2) vii. pp. 280-289, reviews the systematical arrangement of this Order, and proposes a modification of it, founded on the degrees of reduction in the thoracic and abdominal segments, as follows:—

Sub-Ord. 1. ELEUTHERA, all of which continue free swimmers in their adult state.

Sub-Ord. 2. PARASITICA.

Fam. 1. *Holotmeta*. All segments distinct, except the first thoracic one in some of them.

Sub-fam. 1. *Ascomyzontidae*: two free ovisacs. *Ascomyzon*, *Asterocheres*, *Dyspontius*, *Artotrogus*, *Terebellicola*, *Sabelliphilus*, *Sepicola*, *Eolidicola*, *Lichomolpus*, *Eucanthus*, *Bomolochus*, *Clausidium*, *Doridicola*, *Thersites*, *Ergasilus*, *Nicothoe*.

Sub-fam. 2. *Notodelphyidae*: eggs carried in cavities formed by the latter thoracic segments. *Notodelphys*, *Goniodelphys*, *Doropygus*, *Notopterophorus*, *Botachus*, *Gunentophorus*.

Sub-fam. 3. *Ascidicolidae*: eggs agglutinated on the back, and protected by two lamellar outgrowths of the fourth thoracic segment. *Ascidicola*, ? *Conephilus*.

Fam. 2. *Hemitmeta*. Segmentation imperfect in the adult.

Fam. 3. *Atmeta*. Segmentation entirely wanting in the adult.

CALANIDÆ.

Cetochilus septentrionalis (Goodsir) abounding in the Arctic Sea; the genus appears sufficiently distinct from *Calanus*, but the several species distinguished by Krøyer are rather questionable. Buchholz, Zweite deutsche Nordpolarfahrt, pp. 390 & 391, pl. xv. fig. 2.

Diaptomus castor (Jurine). A specimen apparently belonging to this species found at the side of the ship in East Greenland, February, 1870; *id. l. c.* p. 392.

CYCLOPIDÆ.

Thorellia brunnea (Böck), from East Greenland; *id. l. c.* p. 395.

HARPACTIDÆ.

Zaus ovalis (Goodsir), from East Greenland, shortly described; *id. l. c.* p. 394.

Cleta minuticornis (Müller), from East Greenland; *id. l. c.* p. 393, pl. xv. fig. 3.

ASCOMYZONTIDÆ.

Clausidium, g. n.; shape of the body and segmentation as in *Artotrogus* and *Asterocheres*; no proboscis, inner branches of all pairs of feet with suckers, except the last; first pair strongly developed, provided with spines. *C. testudo*, sp. n., Naples, parasitic on *Callianassa subterranea*. Kossman, Verh. Ges. Würzb. (2) vii. pp. 289–292, pl. vi.

NOTODELPHYIDÆ.

Ophioseide (Hesse), parasitic on a compound Ascidian, *Astellium perspicuum*, and its Nauplius described. Giard, Arch. Z. expér. ii. (1873) p. 481, pl. ix.

SIPHONOSTOMA.

LERNEIDÆ.

Achtheres [?] *carpenteri*, sp. n., A. S. Packard, Jr., in Hayden's Ann. Rep. of the U. S. Geol. and Geogr. Survey for 1873, p. 612, fig. 1, Colorado, from trout. Perhaps to be regarded as type of a new subgenus; and in some respects allied to *Caulozenus*.

XIPHOSURA.

Limulus polyphemus (L., F.), caught on the Dutch coast, about 11 miles off the Shelling light, by Yarmouth trawl boats. Am. J. Sci. (3) vii. p. 162 [perhaps escaped during transport for European aquariums.]

CIRRIPEDIA.

LEPADIDÆ.

Dichelaspis aymonini, sp. n., Lessona & Tapparone-Canefri, Atti Acc. Tor. ix. 12 pp. 1 pl. Japan, on the gills of *Macrochira kæmpferi*.

Scalpellum stræmi (Sars), from dredgings on the coast of New England, figured by Verrill, Am. J. Sci. (3) vii. pl. viii. fig. 7.

Scalpellum regium, sp. n., Thomson, J. Zool. iii. p. 133, Atlantic.

ABDOMINALIA.

Cochlorine hamata (Noll; Zool. Rec. x. p. 195): description also published in Z. wiss. Zool. xxv. [1874] pp. 114–128, pl. vi.

PELTOGASTRIDÆ.

Giard confirms the hermaphroditism of the *Suctorina*, and gives notes on their larvæ. C. R. lxxvii. (1873) pp. 945-948.

The presence of *Sacculina* makes crabs sterile; it is itself destroyed through pressure by *Molgula socialis*, when fixed on the same crab; several other animals, *Polyzoa*, *Annelides*, and Sponges, are to be found on the tail of the crab at the same spot. Giard, C. R. lxxix. pp. 241-243, and Ann. N. H. (4) xiv. pp. 386-388.

Pachybdella carcini (Thomps.). Its Nauplius-stage described by A. Stuxberg, Cefv. Ak. Förh. 1873, part 9 (issued 1874).

ARANEIFORMIA.*

PYCNOGONIDA.

C. SEMPER has published an interesting paper on the *Pycnogonida* and their larvæ which live parasitically on Hydroid polyps. Arb. Inst. Würzb. i. pt. 4, pp. 264-286, pls. xvi. & xviii. = Verh. Ges. Würzb. (2) vii. pp. 257-279, pls. iv. & v. In *Phoxichilidium mutilatum* (Leuck.), observed by him in Heligoland, the first stage of development goes on within the eggs in the ovisac, and the following stages are found as parasites in the intestinal cavity of *Hydractinia echinata*. At first, the animal has three pairs of feet, the foremost armed with claws, the two others with long bristles; when it leaves the *Hydractinia*, it has also three pairs of definitive feet, but not the same, the first definitive being the third, and the rudimentary palpus of the adult animal the second, foot of the larva; in the second moult of the free animal, the fourth pair of feet make their appearance. Semper pronounces himself in favour of the view that the *Pycnogonida* belong to the *Arachnida*, their cephalothorax consisting typically of six segments (not seven, as Dohrn surmised, reckoning a segment and pair for the ovisacs), and gives a systematical list of all known species. The so-called *Phoxichilidium*, the development of which has been described by A. Dohrn, Jen. Z. Nat. v. 1869, is probably a *Pallene*; p. 258, foot-note.

Oomerus, g. n.; distinguished from all other *Pycnogonida* by the eggs being borne in the femoral joints of the well-developed thoracic feet, instead of in ovisacs, and by its lateral tracheal openings. *O. stigmatophorus*, sp. n., Hesse, Ann. Sci. Nat. (5) xx. art. 17, pp. 1-17, pl. viii. Brest.

Notes on the larvæ of *Phoxichilidium femoratum* (Rathke) and *Nymphon grossipes* (F.); *id. l. c.* p. 7, pl. viii. figs. 13-17, 18-21.

Nymphon grossipes (F.), *mixtum* [-tus] (Kröy.), and *hirtum* [-tus] (F.), from the east coast of Greenland; notes by Buchholz, Zweite deutsche Nordpolarfahrt, ii. pp. 396 & 397.

* The Recorder considers these better placed in the *Arachnida*.

ARACHNIDA.

BY

THE REV. O. P. CAMBRIDGE, M.A., C.M.Z.S.

THE GENERAL SUBJECT.

KOCH, C. Beiträge zur Kenntniss der Nassauischen Arachniden. I. Die Familien der Mithraides, Pholcides, Eresides, Dysderides und Mygalides. JB. Nass. Ver. xxvii. & xxviii. pp. 185-210.

The author divides the class *Arachnoidea* into 6 orders, *Aranea*, *Arthrogastra*, *Acarina*, *Helminthogastra*, *Ixodea*, and *Apneusta*; and commences an account of the species found in Nassau by describing those of the groups mentioned in the title, reserving the 7 other European families of C. L. Koch's system for further notice. Twelve species (3 new) are now discussed.

SIMON, EUGÈNE. Les Arachnides de France, i. pp. 1-272, pls. i.-iii. Paris: 1874.

This work is intended to embrace other orders of Arachnids besides the *Araneidea*.

— Études Arachnologiques, v. & vi. Ann. Soc. Ent. Fr. (5) iv. pp. 243-282, pl. v.

Part v. comprises a revision of the European species of the *Sparassides*; Part vi., a description of a new species of *Scorpionides* (*Buthus*).

Galicia. Papers on the *Arachnida*, mostly of local interest, by the following writers, are published in the "Sprawozdanie Komisyi Fizyograficznej" of the Cracow Academy:—vol. ii. (1868), M. Nowicki, p. (90), and L. Wajgiel, pp. (153)-(155); iv. (1870), M. Nowicki, pp. (15)-(19); vi. (1872), Iachno, pp. (4)-(6); viii. (1874) M. Nowicki, pp. (1)-(11).

Leopold Wajgiel's "Die Galizischen Arachniden" (written in Polish), Kolomea, Galizia, containing 266 species, has not been seen by the Recorder [cf. Das Ausland, xvii. p. 240].

ARANEIDEA.

BLACKWALL, JOHN. A concise notice of observations on certain peculiarities in the structure and function of the *Araneidea*. Ann. N. H. (4) xiii. pp. 340 & 341.

Contains some observations on the calamistra of certain Spiders, and

on the correlated additional spinners, or inframamillary organ; the calamistra of the male spider being stated to be frequently much less conspicuous than those of the female.* Some difficulties are mentioned in connection with the conclusions of the late Richard Beck (communicated to the Microscopical Society in 1861) as to the formation of the viscid globules of the spiral line in the snare of *Epeira diademata* (Clk.).

CAMBRIDGE, O. P. Systematic list of the Spiders at present known to inhabit Great Britain and Ireland. Tr. L. S. xxx. pp. 319-334.

A catalogue of 457 species, distributed among 78 genera, based upon the results of a comparison of typical examples, of most of the species, from Sweden, Germany, and France, with those of England, with a view to establish a correct nomenclature in accordance with the laws of priority. The following shows the distribution of species among the various genera:—

Atypus, 2; *Oonops*, 1; *Schenobates*, 1; *Dysdera*, 2; *Harpactes*, 1; *Segestria*, 2; *Micarea*, 1; *Drassus*, 9; *Gnaphosa*, 2; *Prosthesima*, 4; *Clubiona*, 15; *Chiracanthium*, 4; *Anyphæna*, 1; *Agæca*, 2; *Liocranum*, 4; *Hecæerge* (*Zora*), 2; *Phrurolithus*, 1; *Eresus*, 1; *Dictyna*, 5; *Argyroneta*, 1; *Amaurobius*, 3; *Lethia*, 3; *Cælotus*, 3; *Agelena*, 3; *Tegenaria*, 5; *Tetriz*, 2; *Cryphæa*, 1; *Hahnia*, 3; *Scytodes*, 1; *Pholcus*, 1; *Episinus*, 1; *Pholcomma*, 1; *Theridium*, 18; *Nesticus*, 1; *Phyllonethis*, 2; *Dipena*, 1; *Steatoda*, 6; *Euryopsis*, 4; *Asagena*, 1; *Neriene* (*Erigone*, Sav., pt.), 76; *Walckenaera* (*Erigone*, Sav., pt.), 55; *Pachygnatha*, 3; *Tapinopa*, 1; *Linyphia*, 66; *Ero*, 1; *Meta*, 3; *Tetragnatha*, 1; *Cyrtophora*, 1; *Singa*, 4; *Cercidia*, 1; *Zilla*, 2; *Epeira*, 20; *Uloborus*, 1; *Hyptiotes*, 1; *Thomisus*, 1; *Misumena*, 2; *Dica*, 2; *Xysticus*, 23; *Philodromus*, 10; *Thanatus*, 2; *Micrommata*, 1; *Ocyale*, 1; *Dolomedes*, 1; *Pirata*, 5; *Trochosa*, 5; *Lycosa*, 10; *Tarentula*, 5; *Oxyopes*, 1; *Epiblemum*, 3; *Heliophanus*, 3; *Ballus*, 1; *Marpessa*, 3; *Evophrys*, 5; *Phileus*, 1; *Attus*, 11; *Ælurops*, 1; *Yllenus*, 2; *Salticus*, 1.

For general synonymy, descriptions, and figures reference is made to the published works of Blackwall, Thorell, and Cambridge.

KARSCH, FERDINAND. Verzeichniss Westfälischer Spinnen (Ara-
neiden). Ver. Verh. Rheinl. (3) x. [1873] pp. 113-160, pl. i.

154 species are recorded, and of these 2 are described and figured as new. The species are distributed among 70 genera as follows:—

Epeira, 17; *Cyclosa*, 1; *Zilla*, 1; *Zygia*, 1; *Cercidia*, 1; *Singa*, 3; *Meta*, 2; *Tetragnatha*, 1; *Pachygnatha*, 3; *Linyphia*, 9; *Lepthyphantes*, 3; *Bolyphantes*, 2; *Stemonyphantes*, 2; *Drapetisca*, 1; *Tapinopa*, 1; *Ero*, 1; *Steatoda*, 7; *Neottiura*, 1; *Theridium*, 1; *Crustulina*, 1; *Eucharia*, 2; *Gonatium*, 2; *Tmeticus*, 1; *Erigone*, 2; *Lophomma*, 1; *Phalops*, 1; *Dictyna*, 3; *Hahnia*, 1; *Tegenaria*, 1; *Phileca*, 2; *Agæca*, 1; *Tetriz*, 1; *Agelena*, 1; *Amaurobius*, 3; *Segestria*, 1; *Dysdera*, 1; *Harpactes*, 1; *Argyroneta*, 1; *Melanophora*, 2; *Micaria*, 2; *Phrurolithus*, 1; *Chiracanthium*, 2; *Anyphæna*, 1; *Clubiona*, 7;

* The Recorder has never been able to detect a trace of calamistra in the males of any Spider that has come under his notice.

Drassus, 4; *Drassodes*, 2; *Zora*, 1; *Dolomedes*, 1; *Ocyale*, 1; *Tarentula*, 6; *Limonia*, 3; *Trochosa*, 1; *Arctosa*, 1; *Pirata*, 1; *Potamia*, 2; *Pardosa*, 4; *Xysticus*, 5; *Coriarachne*, 1; *Thomisus*, 2; *Diaea*, 1; *Misumena*, 1; *Artanes*, 2; *Philodromus*, 2; *Thanatus*, 1; *Epi-blemum*, 1; *Heliophanus*, 2; *Ballus*, 1; *Attus*, 7; *Evophrys*, 2; *Marpessa*, 1.

KOCH, LUDWIG. Die Arachniden Australiens, nach der Natur beschrieben und abgebildet. Nürnberg: 1874, pt. 11, pp. 529–576, pls. xli.–xliv.

In continuation of the work [Zool. Rec. ix. p. 207, x. p. 198]. 23 species (17 new) and 3 new genera (*Thomisides*) are characterized.

— Beschreibungen einiger von Herrn Dr. Zimmermann bei Niesky in der Oberlausitz und im Riesengebirge entdeckter neuer Spinnenarten. Abh. Ges. Görl. xv. [Sep. copy, pp. 1–21, pl. i.]

Six new species, of as many genera, are described, and a catalogue is given of 70 species (*Epeirides*, 2; *Theridiides*, 11; *Agelenides*, 7; *Drassides*, 25; *Thomisides*, 4; *Lycosides*, 11; *Salticides*, 10) found by Zimmermann since the publication of his work, "Die Spinnen der Umgegend von Niesky." [Cf. Zool. Rec. viii. p. 199.]

MOGGRIDGE, J. TRAHERNE. Harvesting Ants and Trap-door Spiders. Supplement, pp. 180–253, pls. xiii.–xx. London: 1874.

Contains additional facts and considerations upon several genera of Spiders and their nests. 8 new and 4 known species, with the nest formed by each, are figured. [The author's researches have furnished, in this supplement, matter of much interest and importance, and his death (previously to the publication of this volume), in Nov. 1874, is an occasion of the deepest regret to all Arachnologists.] Abstract and reviews of the whole work are given by G. Rochette, Arch. Sci. nat. i. (sep. copy) pp. 1–31, pl. i., and by E. Simon, Feuil. Nat. nos. 46, pp. 115–117, and 47, pp. 125–128.

SIMON, EUGÈNE. Les Arachnides de France. [Suprà.]

Contains descriptions of the 130 known species, distributed among 23 genera, of the families *Epeirides*, *Uloborides*, *Dictynides*, *Enyoides*, and *Pholcides*. 16 new species and 2 new genera are characterized. An introductory chapter, pp. 1–16, treats generally of the *Araneidea* under the term *Aranea* (Sund.). After characterizing the order, the faunistic literature upon it, and some of the different systems of classifications are glanced at; that adopted being based chiefly upon a supposed essential difference in the eyes; some being "*Nocturnes*," i.e., flattened, colourless, variable in form, and intended only for seeing by night, others, "*Diurnes*," i.e., convex, round, and coloured; the two kinds are, however, found at times in the same individual. For details of this system, reference is made to a paper in Mém. Liège, 1873 [cf. Zool. Rec. x. p. 199]. Its outlines (reversing the order maintained in Mém. Liège) are as follows:—Sub-order I.: ARANEÆ OCULATÆ. Fam. 1, *Attidæ*; 2, *Lycosidæ*; 3, *Oxyopidæ*. Sub-order II.: ARANEÆ VERÆ. Fam. 4, *Sparassidæ*; 5, *Thomisidæ*; 6, *Palpimanidæ*; 7, *Eresidæ*; 8, *Epeiridæ*, 9; *Uloboridæ*;

10, *Theridiidæ*; 11, *Pholcidæ*; 12, *Hersiliidæ*; 13, *Urocteoidæ*; 14, *Enyoidæ*; 15, *Agelenidæ*; 16, *Dictynidæ*; 17, *Drassidæ*. Sub-order III.: ARANEÆ GNAPHOSÆ. Fam. 18, *Scytodidæ*; 19, *Dysderidæ*. Sub-order IV.: ARANEÆ THERAPHOSÆ. Fam. 20, *Filistatidæ*; 21, *Avicularidæ*. Separate analytical tables of families, genera, and species are given, in some cases of *males* as well as females. The descriptions of species and characters of genera and families are mostly clear and terse. Of the *Epeiridæ*, 11 genera are characterized:—*Peltosoma* (2 species); *Argiope*, 2; *Cyrtophora*, 1; *Cyclosa*, 5; *Epeira*, 39; *Larinia*, g. n., 2; *Singa*, 8; *Cercidia*, 1; *Zilla*, 6; *Meta*, 3; *Tetragnatha*, 5. Of the *Uloboridæ*, 2 genera:—*Uloborus*, 3 species, and *Hyptiotes*, 1. Of the *Dictynidæ*, 4 genera:—*Dictyna*, 14 species; *Lethia*, 5; *Titanæca*, 7; and *Amaurobius*, 10. Of the *Enyoidæ*, 3 genera; *Ceto*, g. n., 1 species; *Selamia*, 1; and *Enyo*, 9. Of the *Pholcidæ*, 3 genera:—*Holocnemus*, 1 species; *Pholcus*, 2; and *Spermophora*, 2. The order followed is determined by the convenience of the author's materials. Representatives of the *Epeiridæ*, *Uloboridæ*, and *Dictynidæ* are figured.

The Recorder, *Nature*, xi. [1875] pp. 224–226, in a review of this volume, has questioned the author's classification on the ground that the above mentioned difference in the eyes is, if true, not an essential one, nor of sufficient value to form the basis of a division of the order *Araneidea* into sub-orders; those sub-orders proposed being also shown to be heterogeneous groups.

TACZANOWSKI, LADISLÁS. Les Aranéides de la Guyane française. *Der-nière partie*. *Hor. Ent. Ross.* x. pp. 56–115, pl. ii.

The conclusion of former papers [see *Zool. Rec.* ix. p. 207, x. p. 199]. Records 49 species, of which 38 are described as new, with characters of two new genera.

WESTRING, N. Bemerkungen über die Arachnologischen Abhandlungen von Dr. T. Thorell unter dem Titel, 1^o On European Spiders, &c., pts. 1 & 2, Upsala, 1869–70: 2^o Remarks on Synonyms of European Spiders, Upsala, 1872–73. *Göteb. Handl. (n. s.)* xiv. (sep. copy) pp. 1–68.

Much of the author's very minute criticism (in fact, almost censure) of Thorell's works probably arises from his want of familiarity with the English language.

UNDERHILL, H. M. J. Spiders' Webs and Spinnerets. *Sci. Goss.* 1874, pp. 200 & 201, 4 woodcuts.

The author describes the separate functions of the different spinners, including those of the 4th pair; figuring the latter, with the orifices (not tubes), 1250 in number, for the emission of silk, and the silk glands connected with them. These have never (it is believed) been before dissected and figured. [Thorell's doubt (*Syn. Eur. Spid.* p. 595) as to the spinning functions of the supernumerary mammillæ, or 4th pair of spinners, appears therefore to be thus completely dispelled.]

Supposed antipathy of Spiders to chestnut-wood; *Nature*, x. pp. 6 & 26.

THERAPHOSIDES.

J. T. Moggridge, *l. c.* p. 193, pl. xiv., describes and figures seven different types of trap-door spiders' nests:—*a*, Purse net door nest (*Atypus*); *b*, Cork nest (*Cteniza* and *Nemesia*, pt.); *c*, Single door, unbranched wafer nest; *d*, Single door, branched wafer nest; *e*, Double door, unbranched wafer nest; *f*, Double door, branched wafer nest; *g*, Double door, branched, cavity, wafer nest: the 5 last species belong to *Nemesia*. The terms 'cork' and 'wafer' apply to the two forms of lid with which the nests close at the upper end; the 'cork' lid fits into the opening, the 'wafer' lid merely over it. The 'double-door' refers to the curious inner valvular flap with which either the lower part of the main tube, or its branch, may be shut off from the rest.

John S. Hittell in "The Resources of California" (6th edition, San Francisco: 1874), speaks of "Tarantulas" (evidently alluding to some species of *Theraphosides*) of large size, body 2 inches long and span of legs 5 inches, living in trap-door nests; he says, "in the top of the door are several little holes, into which the Tarantula can insert its claws when it wishes to enter; and so quick are its motions, when terrified, that it often disappears suddenly under the eyes of men pursuing it, and they have great difficulty in finding its hiding-place." A graphic, but somewhat sensational, account is given of the attack upon one of these spiders by a large "wasp," ending in the defeat of the spider, the wasp's object being to deposit its eggs in the spider's body. Several other species of small spiders are spoken of as living in similar dwellings or 'trap-door' nests; one kind having many representatives on Telegraph Hill, in San Francisco.

A. Roger, *Sci. Goss.* 1874, p. 206, gives a rather sensational account of the habits of a trap-door spider, *Mygale cementaria* [?]. If the facts are to be relied upon, the spider's habits are diurnal.

Cteniza moggridgii, Mentone and San Remo, p. 254, pl. xx. figs. A, A 1–A 9, *californica*, Visalia, California, pp. 260 & 198, pl. xv. fig. B, O. P. Cambridge, in Supplement to Moggridge's Harvesting Ants and Trap-door Spiders: spp. nn.

Nemesia cementaria, Cambr. (*nec* Latr.), re-named *moggridgii*; E. Simon, *Feuil. Nat.* no. 46, p. 117. The true *N. cementaria*, Latr., described, p. 264, figured, pl. xix. fig. B, and its identity discussed, pp. 269–272; O. P. Cambridge, *l. c.*

Nemesia manderstjernæ, Auss., described and figured, from San Remo, Bordighera, Mentone, Cannes, and Hyères, pp. 254 & 283, pl. xx. figs. B & C; *N. meridionalis*, Costa, differentiated from it, and figured, from Corsica, pp. 215 & 289, pl. i. figs. 2 & 3; *N. alpigrada*, Sim., = *N. eleanora*, Cambr., p. 272; O. P. Cambridge, *l. c.*

Nemesia incerta, Digne, pp. 276 & 229, pl. xix. fig. D, *N. dubia*, Pyrenees, pp. 280 & 229, pl. xix. fig. E, *N. congener*, Hyères, pp. 293 & 225, pl. xviii. fig. A, *N. suffusa*, Montpellier, pp. 295 & 215, pl. xvii. fig. A, *N. simoni*, Bordeaux, pp. 297 & 211, pl. xvi. fig. A; *id. l. c.*: spp. nn.

1874. [VOL. XI.]

COLOPHONIDES.

This new family proposed for *Colophon*, g. n., connecting the *Theraphosides* and *Filistatides*. Cephalothorax oblong-oval; clypeus long, impressed, and prominent; eyes 8, unequal in size, closely grouped in a transverse oblong-oval figure on a slight tubercular elevation towards the fore part of the caput, three on each side form two broad rows enclosing two others in a central transverse line; legs moderately long and strong, relative length 4, 1, 2, 3; tarsal claws, 3; falces small and projecting, the fangs folding down over their inner edges; maxillæ moderate in length, broad and strong near their base, strongly inclined to the labium, and broadly and obliquely impressed transversely in front; labium long, rather broadest near the middle; abdomen elongate oval, joined to the cephalothorax by a distinct pedicle; spiracular openings 4, 2 immediately in front of the usual pair; spinners, 6, 2 superior, and 4 in a straight transverse row beneath them. *C. natalensis*, sp. n., ♂ & ♀, pl. xvii. fig. 1, Natal. O. P. Cambridge, Ann. N. H. (4) xiv. p. 170.

FILISTATIDES.

Filistata bicolor, Walck.; numerous examples from Cayenne. L. Taczanowski, Hor. Ent. Ross. x. p. 72.

DYSDERIDES.

Dysdera cærulescens, sp. n., C. Koch, JB. nass. Ver. xxvii.-xxviii. p. 203, Nassau (? = *crocota*, C. L. Koch).

Segestria longipes, p. 206, *atrata*, p. 207, spp. nn., *id. l. c.* Nassau.

DRASSIDES.

O. P. Cambridge, P. Z. S. 1874, pp. 370-419, pls. li. & lii., has described 40 species of various genera (all, but one, new), and figured the palpi or genital aperture of nearly all.

Micaria silesiaca, ♂, L. Koch, Abh. Ges. Görl. xv. (sep. copy) p. 4, pl. i. figs. 2 & 3, Niesky; *M. salticina*, ♀, L. Taczanowski, *l. c.* p. 75, pl. ii. fig. 3, Uassa (French Guiana); *M. armata*, ♀, O. P. Cambridge, *l. c.* p. 401, pl. lii. fig. 26, Mentone: spp. nn.

Drassus nigrifemoratus, ♂, p. 385, pl. li. fig. 12, Italy, *D. bulbifer*, ♂, p. 386, pl. li. fig. 13, Europe, *D. ornatus*, ♀, p. 388, Alexandria (Egypt), *D. ensiger*, ♂ & ♀, p. 389, pl. li. fig. 14, Smyrna, *D. hebes*, ♂, p. 390, pl. li. fig. 15, Mentone, *D. macilentus*, ♀, p. 392, pl. li. fig. 16, Bombay, *D. campestratus*, ♂, p. 392, pl. li. fig. 17, *D. alexandrinus*, ♂, p. 393, pl. li. fig. 18, and *D. ægyptius*, ♂ & ♀, p. 394, pl. lii. fig. 19, Alexandria, *D. astrologus*, ♀, p. 395, pl. lii. fig. 20, *D. luridus*, ♂ & ♀, p. 396, pl. lii. fig. 21, and *D. ferrugineus*, ♀, p. 398, pl. lii. fig. 23, Bombay, *D. vulpinus*, ♀, p. 397, pl. lii. fig. 22, *D. denotatus*, ♀, p. 398, pl. lii. fig. 24, and *D. pugnaz*, ♂, p. 399, pl. lii. fig. 25, Cairo; O. P. Cambridge, *l. c.* spp. nn.

Gnaphosa harpax, ♂, p. 371, fig. 1, Bombay, *G. procera*, ♂ & ♀, p. 373, fig. 2, Alexandria, *G. marginata*, ♀, p. 374, fig. 3, Egypt, *G. venatrix*, ♂,

p. 375, fig. 4, Alexandria, *G. corcyrae*, ♂, p. 376, fig. 5, Corfu. *Id. l. c.* pl. li.: spp. nn.

Prosthesima lugubris, ♀, p. 378, fig. 7, Ischl, *P. cingara*, ♀, p. 382, fig. 10, Corfu, *P. tristicula*, ♂, p. 377, fig. 6, *P. curina*, ♂, p. 379, *P. nilicola*, ♂, p. 380, fig. 8, *P. mollis*, ♀, p. 381, fig. 9, and *P. pallida*, ♂ & ♀, p. 383, fig. 11, Alexandria; *id. l. c.* pl. li. spp. nn.

Clubiona filicata, ♂ & ♀, p. 413, fig. 35, and *C. drassodes*, ♀, p. 414, fig. 36, *id. l. c.* pl. lii., Bombay; *C. annulipes*, ♀, p. 76, pl. ii. fig. 4, Uassa (French Guiana), and *C. ? anomala* [certainly not a *Clubiona*], ♂, p. 77, fig. 5, Cayenne, L. Taczanowski, *l. c.*: spp. nn.

Chiracanthium dubium, ♂, p. 403, fig. 28, Alexandria, *C. equestre*, ♂ & ♀, p. 404, fig. 29, Cairo, *C. inornatum*, ♂ & ♀, p. 406, fig. 30, Bombay, *C. isiacum*, ♂ & ♀, p. 407, fig. 31, and *C. insigne*, ♂ & ♀, p. 408, fig. 32, Bombay and Ceylon, *C. vorax*, ♂ & ♀, p. 410, fig. 33, and *C. indicum*, ♂, p. 411, fig. 34, Bombay; O. P. Cambridge, *l. c.* pl. lii.: spp. nn.

Agræca pulcherrima, ♂, p. 414, pl. lii. fig. 37, Andes, *A. walsinghami*, ♂, p. 416, Oregon; *id. l. c.*: spp. nn.

Liocranum lusaticum, sp. n., ♂ & ♀, L. Koch, Abh. Ges. Görl. xv. (sep. copy, p. 6) pl. i. figs. 4-6, Niesky.

Phrurolithus splendidus ["*Theridium (Phrurolithum) splendidum*"], sp. n., ♀, L. Taczanowski, *l. c.* p. 60, Uassa.

DICTYNIDES.

The family *Dictynidae* of E. Simon comprises *Lethia*, *Dictyna*, *Amaurobius*, and *Titanæca*. E. Simon, *Arachnides de France*, i. p. 176.

Dictyna characterized and separate analytical tables of males and females of 14 species given; *id. l. c.* pp. 177-180.

Dictyna mandibularis, sp. n., ♀, L. Taczanowski, *l. c.* p. 61, Cayenne, *D. puella*, Sim., p. 180, pl. iii. fig. 4, *D. flavescens*, Walck., p. 181, *D. viridissima*, Walck., p. 183, *D. bicolor*, Sim., p. 184, *D. uncinata*, Thor., p. 186, *D. pusilla*, Thor., p. 187, *D. koziorowiczii*, Sim., p. 188, *D. civica*, Lucas, p. 189, *D. arundinacea*, Luc., p. 191, *D. latens*, Fabr., p. 192, and *D. globiceps*, Sim., p. 196, pl. iii. fig. 5, described; E. Simon, *l. c.*

Dictyna vicina, ♂ & ♀, p. 192, Ajaccio, *D. scabra*, ♂ & ♀, p. 195, Vaucluse, *D. patula*, ♀, p. 197, Paris, *id. l. c.*: spp. nn.

AGELENIDES.

Amaurobius characterized, p. 220, and separate analytical tables of species (males 8, females 8) given, p. 222; E. Simon, *l. c.*

Amaurobius cayanus, ♀, Cayenne, p. 79, *A. rufipes*, ♂ & ♀, Cayenne and Îles du Salut, p. 80, *A. brevis*, ♀, Uassa, p. 81, *A. hirtus*, ♀, Cayenne, p. 83, spp. nn., L. Taczanowski, *l. c.*; *A. latebrosus*, ♂, p. 224, *A. corsicus*, ♀, p. 232, spp. nn., Vizzavona (Corsica), Simon, *l. c.*; *A. claustrarius* (Hahn), ♂ & ♀, p. 223, pl. iii. fig. 11, *A. erberi*, Keys, ♂ & ♀, p. 225, pl. iii. fig. 12, *A. fenestralis*, Stroem, ♂ & ♀, p. 226, pl. iii. figs. 15 & 16, *A. similis*, Blackw., ♂ & ♀, p. 228, pl. iii. figs. 13 & 14, *A. scopoli*, Thor., ♂ & ♀, p. 229, *A. crassipalpis*, Canestr. & Pav., ♂, p. 230, *A. ferox*, Walck., ♂ & ♀, p. 232, *A. jugorum*, L. Koch, ♀, p. 234, described; *id. l. c.*

Titanæca characterized, p. 207, and separate analytical tables of species (males 7, females 5) given, p. 209; *id. l. c.*

Titanæca nivalis, sp. n., ♂ & ♀, Alps, p. 210, *T. flavicoma*, L. Koch, ♂ & ♀, p. 209, *S. schineri*, L. Koch, ♂ & ♀, p. 212, pl. iii. fig. 9, *T. monticola*, Sim., ♂ & ♀, p. 214, pl. iii. fig. 10, *T. quadriguttata*, Hahn, p. 215, pl. iii. fig. 8, *T. præfica*, Sim., ♂, p. 217, *T. albimaculata*, Luc., ♂ & ♀, p. 218, pl. iii. fig. 7, described; *id. l. c.*

Lethia characterized, p. 191, and analytical tables of species (males 4, females 5) given; *id. l. c.* p. 200.

Lethia meridionalis, South of France, ♂ & ♀, p. 202, *L. lucida*, ♀, Hautes Alpes (France), p. 203, spp. nn., *L. puta* (Cambr., Zool. 1863, p. 8570), ♂ & ♀, p. 204, pl. iii. fig. 6, *L. puta* (Cambr., P. Z. S. 1872, p. 262) re-named *cambridgii*, p. 205, *L. humilis*, Bl., ♂ & ♀, p. 207, *L. mengii*, Cambr., ♂ (England), p. 206, described; *id. l. c.*

Tegenaria derhami, Scop., from Nova Zembla; T. von Henglin, Reisen nach dem Nordpolarmeer, iii. p. 236.

Mutusca, g. n., doubtfully assigned to this family; O. P. Cambridge, Ann. N. H. (4) xiv. p. 172. Cephalothorax nearly round, eyes 8, unequal, nearly similar in position to those of *Enyo* and *Miltia*. Maxillæ strong, greatly enlarged at their bases, transversely impressed near the middle, and greatly inclined to the labium; palpi inserted nearer the base than the extremity. Legs (basal joints only) very strong, relative length 4, 1, 2, 3. Abdomen oblong-oval. Spinners, 4 only, ? two at the extremity in the usual position, and two others of great length issuing from not far behind the spiracular plates, and projecting backwards beyond the extremity of the abdomen. *M. mammosa*, sp. n., ♂; *id. l. c.* p. 173, pl. xvii. fig. 2, Shelley's Flats, Australia.

Tristichops, g. n. [= *Cydippe*, Cambr.], for *T. cærulescens*, sp. n., ♂, L. Taczanowski, *l. c.* p. 110, pl. ii. fig. 10, St. Laurent de Maroni.

Ceto, g. n., = *Selamia*, Sim., pt., but differs from it in having a scopula, though without spines on the legs, also in the shorter and broader form of the cephalothorax, and the different proportion of the eyes. Type, *S. unicolor*, Sim. E. Simon, Arachn. de Fr. i. p. 238.

Selamia characterized, p. 239; type, *S. reticulata*, Sim., described, p. 240; *id. l. c.*

Enyo characterized, p. 241, and separate analytical tables of species (males 9, females 9) given, p. 243; *E. elegans*, Sim., ♂ & ♀, p. 244, *E. germanica*, ♂ & ♀, O. Koch, p. 245, *E. nigriceps*, ♂ & ♀, Sim., p. 246, *E. gallica*, Sim., ♂ & ♀, p. 247, *E. italica*, Canestr. & Pav., ♂ & ♀, p. 248, *E. marginata*, Sim., ♂ & ♀, p. 250, *E. soror*, Sim., ♂ & ♀, p. 252, described; *E. tumida*, ♂ & ♀, Digne, p. 249, and *E. fulvo-nigra*, ♂ & ♀, Alpes Maritimes, p. 251, spp. nn.; *id. l. c.*

SCYTODIDES.

Scytodes marmorata, ♂ & ♀, Cayenne, p. 106, pl. ii. fig. 8, *S. lineatipes*, ♀, Cayenne and Iles du Salut, p. 107, and *S. guianensis*, ♀, Uassá and St. Laurent de Maroni, p. 108; L. Taczanowski, *l. c.*, spp. nn.

PHOLCIDES.

The family characterized by E. Simon, *Arachn. de Fr. i.* p. 254, with analytical table of genera, p. 255.

Holocnemus characterized, p. 256, and *H. rivulatus*, Forsk., described, p. 257; *id. l. c.*

Pholcus characterized, p. 258, *P. opilionoides*, Schranck, ♂ & ♀, p. 259, and *P. phalangioides*, Forsk., ♂ & ♀, p. 261, described; *id. l. c.* *P. cyaneus*, ♂ & ♀, p. 103, fig. 6, and *P. tigrinus*, ♂, p. 104, fig. 7, Uassa and St. Laurent de Maroni, and *P. globosus*, ♀, Cayenne, p. 105, spp. nn.; L. Taczanowski, *l. c.* pl. ii.

Spermophora, Hentz [erroneously printed *Spermophila* in *Zool. Rec. x.* p. 204], characterized, p. 263; *S. senoculata*, Dugès, ♂ & ♀, p. 264, and *S. elevata*, Sim., ♂ & ♀, p. 265, described; E. Simon, *Arachn. de Fr. i.*

THERIDIIDES.

Theridium albo-notatum, Cayenne, p. 56, *T. citrinum*, p. 57, Uassa, *T. rubro-lineatum*, Cayenne and Uassa, p. 58, spp. nn., L. Taczanowski, *l. c.*

Euryopsis zimmermanni, sp. n., ♂ & ♀, L. Koch, *Abh. Ges. Görl. xv.* pl. i. fig. 1, Niesky.

Erigone angustata, ♂ & ♀, Sweden, N. Westring, *Göteb. Handl. (n. s.) xiv.* p. 34 (sep. copy); *E. dentigera*, ♂ & ♀, p. 430, Beverley, U.S.A., *E. probata*, ♂ & ♀, p. 431, fig. 2, Oregon, and *E. interpres*, ♂ & ♀, p. 430, fig. 1, *E. spinifera*, ♂ & ♀, p. 432, fig. 3, *E. læta*, ♂ & ♀, p. 433, fig. 4, *E. lætabilis*, ♂, p. 435, fig. 5, *E. emertoni*, ♂ & ♀, p. 435, fig. 6, *E. atriceps*, ♂, p. 436, fig. 7, *E. fissiceps*, ♂ & ♀, p. 438, fig. 8, *E. directa*, ♂ & ♀, p. 439, fig. 9, and *E. indirecta*, ♂ & ♀, p. 440, fig. 10, various parts of Massachusetts, O. P. Cambridge, *P. Z. S.* 1874, pl. lv.: spp. nn.

Erigone longipalpis, Sund., from Nova Zembla, T. von Henglin, *Reisen nach dem Nordpolarmeer*, iii. p. 236.

Linyphia argentea, ♂ & ♀, p. 65, and *L. ornata*, ♂ & ♀, p. 66, Cayenne and St. Laurent de Maroni, *L. branickii*, ♂ & ♀, p. 67, *L. splendida*, ♀, p. 69, and *L. melanocephala*, p. 70, Cayenne, spp. nn., L. Taczanowski, *l. c.* *L. explicata*, sp. n., ♂ & ♀, England, and *L. cristata*, Menge, ♂, recorded as British; O. P. Cambridge, *Tr. L. S.* xxx. p. 328.

Ero (?) *americana*, ♀, p. 62, and *caudata*, ♂ & ♀, p. 63, spp. nn., L. Taczanowski, *l. c.*, Uassa.

Galena (proposed by Koch [in 1845] upon a single ♂ example of unknown locality, with no generic diagnosis [and not yet recorded as a new genus]) fully characterized: allied to the *Epeirides* in the disposition of the eyes, the front of the head, and form of the abdomen; to the *Thomisides* in the direction and proportion of the legs; and to the *Theridiides* in the small size of the thorax, which is not distinct from the head. *Id. l. c.* pp. 112, 113, & 115. *G. picta*, sp. n., ♂ & ♀, *id. l. c.* p. 113, pl. ii. fig. 11, St. Laurent de Maroni.

EPEIRIDES.

The family characterized, p. 17, and analytical tables of 11 genera given, p. 20; E. Simon, *Arachn. de Fr. i.*

B. G. WILDER, P. Am. Ass. xxii. pt. 2, pp. 257-263, woodcuts, describes the habits of *Epeira riparia*, figuring its cocoon, with transverse sections, showing the eggs of the spider as well as the cocoons of an *Ichneumon*, these being themselves destroyed by Chalcidians. The moulting of *Nephila plumipes* is also illustrated; this is effected in the way described by Blackwall in reference to *Epeira calophylla*. The same author, l. c. pp. 264-274, woodcuts, describes various peculiarities in regard to the formation of the nets of *Epeira*, *Nephila*, and *Hyptiotes*. The general result of a comparison is, that the net of *Epeira* is a perfect circle; that of *Nephila* imperfect, by a wedge of $\frac{1}{4}$ th cut out of it; that of *Hyptiotes* being the wedge wanting in the web of *Nephila*.

Tetragnatha characterized, p. 153; separate analytical tables of species (males 4, females 4), p. 154; *T. extensa*, Sim., p. 155, pl. ii. fig. 15. *T. montana*, Sim., p. 157, pl. ii. fig. 16. *T. nitens*, Aud., p. 159, pl. ii. fig. 14, and *T. chrysochlora*, id. p. 161, pl. ii. fig. 17, described; E. Simon, l. c. *T. ejuncida*, sp. n., ♂, id. l. c. p. 160, Corsica.

Meta characterized, p. 145; separate analytical tables of species (males 2, females 3), p. 146; *M. segmentata*, Clerck, p. 147, *M. merianæ*, Scop., p. 149, and *M. menardi*, Latr., p. 151, pl. ii. fig. 8, id. l. c.

Cyrtophora (*Cyclosa*, Sim.) characterized, p. 36; separate analytical tables of species (males 4, females 5), p. 38; *C. conica*, Pall., p. 38, pl. i. fig. 4, *C. sierræ*, Sim., p. 40, *C. oculata*, Walck., p. 41, pl. i. fig. 5, *C. trituberculata*, Luc., p. 43, pl. i. fig. 6, and *C. lauræ*, Sim., p. 44, pl. i. fig. 7, described; *C. opuntia*, Duf., p. 34, pl. i. fig. 3, described as type of *Cyrtophora*, Sim., which is fully characterized, p. 33; E. Simon, l. c.

Singa characterized, p. 119; separate analytical table of species (males 7, females 8), p. 120; *S. hamata*, Clerck, p. 121, *S. semiatra*, L. Koch, p. 122, pl. ii. fig. 3, *S. nitidula*, C. Koch, p. 124, *S. herii*, Hahn, p. 125, *S. albivittata*, Westr., p. 126, *S. pygmæa*, Sund., p. 128, *S. sanguinea*, C. Koch, p. 130, and *S. rufula*, Sim., p. 131, pl. ii. fig. 4, described; E. Simon, l. c. *S. abbreviata*, sp. n., ♂, F. Karsch, Verh. Ver. Rheinl. (3) x. p. 120, fig. 1, Westphalia.

Cercidia characterized, p. 133; *C. prominens*, Westr., p. 134, pl. ii. fig. 7, described; E. Simon, l. c.

Zilla characterized, p. 135; separate analytical tables of species (males 5, females 6), p. 137; *Z. atrica*, C. Koch, p. 138, pl. ii. figs. 10 & 11, *Z. keyserlingi*, Auss., p. 139, pl. ii. fig. 12, *Z. 10-notata*, Clerck, p. 140, pl. ii. fig. 13, *Z. montana*, C. Koch, p. 141, *Z. kochi*, Thor., p. 143, and *Z. stræmi*, Thor., p. 144, pl. ii. fig. 9, described; id. l. c.

Larinia, g. n., p. 115; closely allied to *Epeira* and *Zilla*. *L. dufouri*, sp. n., ♀, p. 116, pl. ii. figs. 5 & 6, Provence and Vaucluse, and *L. lineata*, Luc., Corsica, Algeria, and Morocco, p. 118, described; id. l. c.

Epeira characterized, p. 46; separate analytical tables of species (males 32, p. 48, females 35, p. 50). *E. angulata*, Clerck, p. 52, pl. i. fig. 11, *E. regia*, C. Koch, p. 54, *E. nordmanni*, Thor., p. 55, *E. grossa*, C. Koch, p. 56, pl. i. fig. 8, *E. circe*, Sav., p. 58, pl. i. fig. 12, *E. spinivulva*, L. Duf., p. 61, pl. i. fig. 10, *E. ulrichi*, Hahn, p. 64, *E. dromedaria*, Walck., p. 62, *E. omeda*, Thor., p. 66, *E. gibbosa*, Walck., p. 67, *E. dalmatica*, Dol., p. 68, *E. pallida*, Oliv., p. 70, pl. i. fig. 9, *E. diademata*, Clerck,

p. 72, pl. i. figs. 13 & 14, *E. marmorea*, Clerck, p. 76, *E. alsine*, Walck., p. 78, *E. quadrata*, Clerck, p. 80, *E. cucurbitina*, Clk., p. 82, *E. alpica*, L. Koch, p. 85, *E. sturmi*, Hahn, p. 86, pl. ii. fig. 1, *E. triguttata*, Fabr., p. 88, pl. ii. fig. 2, *E. redii*, Scop., p. 90, *E. carbonaria*, L. Koch, p. 92, pl. i. fig. 19, *E. coropegia*, Walck., p. 94, *E. armida*, Sav., p. 96, *E. silvicultrix*, C. Koch, p. 98, *E. umbratica*, Clerck, p. 100, *E. thomisoides*, Duf., p. 102, *E. scolopetaria*, Clerck, p. 103, pl. i. fig. 16, *E. hygrophila*, Sim., p. 105, *E. izobola*, Thor., p. 106, *E. cornuta*, Clerck, p. 108, pl. i. fig. 17, *E. patagiata*, Clk., p. 110, pl. i. fig. 18, *E. adianta*, Walck., p. 111, *E. acalypha*, Walck., p. 113, and *E. dioidea*, Walck., p. 114, described; *E. soror*, ♂ & ♀, Corsica, p. 74, pl. i. fig. 15, *E. pyrenæa*, ♂ & ♀, Pyrenees, p. 75, *E. inconspicua*, ♀, North Spain, p. 84, and *E. corticalis*, ♀, Corsica, p. 99, spp. nn.; E. Simon, *l. c.*

Epeira socialis. E. Holmberg, *Anales de Agricultura* (? Buenos Aires), ii. p. 156, Entre Rios, Corriente, Paraguay, gives particulars of economy. Cf. also C. Berg, *Bol. Ac. Cordova*, i. pp. 279-283.

Argiope characterized, p. 26; *A. lobata*, Pall., p. 29, pl. i. fig. 1, and *A. bruennichi*, Scop., p. 31, described; E. Simon, *l. c.*

GASTERACANTHIDES.

Peltosoma characterized, p. 21; *P. tubiculiferum*, Sim., p. 22, pl. i. fig. 2, and *P. izioides*, Sim., p. 24, Corsica; E. Simon, *l. c.*

Calydna,* g. n., allied to *Cyrtarachne*, Thor., and *Eurysoma*, Koch, differing remarkably in the cleft form of the fore part of the caput; *C. prospiciens*, sp. n., ♂, O. P. Cambridge, *Ann. N. H.* (4) xiv. p. 175, pl. xvii. fig. 3, Minas Geraes, Brazil.

ULOBORIDES.

The family characterized, p. 164; *Uloborus* characterized, p. 165; *U. plumipes*, Luc., p. 167, *U. productus*, Sim., p. 169, pl. iii. fig. 1, and *U. walckenaerius*, Latr., p. 170, described; E. Simon, *l. c.*

Hyptiotes characterized, p. 172; *H. paradoxus*, C. Koch, p. 173, pl. iii. figs. 2 & 3; *id. l. c.*

MIAGRAMMOPIDES.

Miagrammopes bradleyi, sp. n., ♀, O. P. Cambridge, *Ann. N. H.* (4) xiv. p. 177, Sydney, N. S. Wales.

THOMISIDES.

E. Simon, *Ann. Soc. Ent. Fr.* (5) iv. p. 243, forms a new family, *Sparassidae*, out of genera hitherto referred to the *Thomisides*,—*Sparassus*, *Micrommata*, and *Cebrensis* and *Ethilla*, two new genera.

Sparassus argelasius, Latr., Spain, Sicily, Algiers, Syria, and Greece,

* Pre-occupied by Westwood; *Lepidoptera*, 1851. The name *Mutina* is therefore proposed for it.—O. P. C.

p. 249, pl. v. fig. 7. *S. oraniensis*, Luc., Algiers, Tangiers, and Morocco, p. 255, and *S. spongitaris*, Duf., France, Corsica, Italy, and Algeria, p. 259, pl. v. fig. 5, described, and synonymy given; *S. letourneuxi*, ♂, Algeria, p. 252, pl. v. fig. 8, *S. doriae*, ♂ & ♀, Teheran, p. 254, pl. v. fig. 6, and *S. cambridgii*, ♀, Syria, p. 257, spp. nn.; *id. l. c.*

Cebrensis, g. n. (= *Heteropoda*, Camb., P. Z. S. 1872), closely allied to *Heteropoda*, Latr.; for *C. wagæ*, sp. n., ♂, p. 265, pl. v. fig. 1, Constantine; *H. kochi*, Cambr. p. 266, pl. v. fig. 2 (described), and *Olios rufipes*, Luc., p. 267; E. Simon, *l. c.*

Ethilla, g. n., closely allied to *Micrommata*; *E. variegata*, sp. n., ♀, *id. l. c.* p. 268, pl. v. fig. 3, Egypt and Syria.

Micrommata characterized, p. 269; *M. virescens*, Clerck, Europe, p. 271, *M. ligurina*, C. Koch, p. 273, Spain, Italy, France, and Corsica, *M. fulva*, Sim., S. France, p. 275, and *M. ornata*, Walck., France, p. 277, described, and synonymy given; *id. l. c.*

Misumena elongata, sp. n., ♀, L. Koch, Arachn. Aust., p. 529, pl. xl. fig. 5, Bowen, Rockhampton, and Cape York. *M. pustulosa*, L. Koch, ♂ & ♀, Brisbane, Bowen, Rockhampton, and Cape York, *id. l. c.* p. 531, pl. xl. fig. 6.

Hedana, g. n., closely allied to *Xysticus*, Koch, p. 534; *H. gracilis*, ♂, p. 534, pl. xli. fig. 1, Sydney, N. S. Wales, and *H. subtilis*, ♂ & ♀, p. 536, pl. xli. fig. 2, Tonga Island, spp. nn.; *id. l. c.*

Cymbacha, g. n., closely allied to *Hedana*, *id. l. c.* p. 538; *C. festiva*, ♂ & ♀, p. 539, pl. xli. figs. 3 & 4, Sydney. *C. saucia*, ♀, p. 542, pl. xli. fig. 5, Port Mackay, *C. ocellata*, ♀, p. 544, pl. xli. fig. 6, Port Mackay and Sydney, and *C. setosa*, ♀, p. 546, pl. xlii. fig. 1, Rockhampton, spp. nn., *id. l. c.*

Tharpyna, g. n., closely allied to *Cymbacha*, *id. l. c.* p. 548; *T. diademata*, ♂ & ♀, p. 548, pl. xlii. figs. 2 & 3, Sydney and Lord Howe's Island, and *T. campestrata*, ♂ & ♀, p. 551, pl. xlii. figs. 4 & 5, Australia (Cape York, &c.), spp. nn., *id. l. c.*

Xysticus bimaculatus, L. Koch, Brisbane and Rockhampton, described and figured, p. 554, pl. xlii. fig. 6; *X. geometres*, ♀, Bowen, Australia, p. 556, pl. xlii. fig. 7, *X. cruentatus*, ♀, Sydney and Bondi, N. S. Wales, p. 558, pl. xliii. fig. 1, *X. ictericus*, ♀, Viti, p. 559, pl. xliii. fig. 2, *X. dameli*, ♂, Sydney and Bowenfels, p. 561, pl. xliii. fig. 3, spp. nn., and *X. pilula*, L. Koch, ♀, Brisbane, p. 563, pl. xliii. fig. 4, described: *id. l. c.* *X. paniscus*, ? sp. n., ♀, *id. Abh. Ges. Görl. xv. p. 9* (sep. copy), fig. 7, Niesky.

Dixa multipunctata, ♂, Sydney, Rockhampton, and Cape Howe, p. 565, pl. xliii. fig. 5, *D. 7-punctata*, ♂, Tonga Island, p. 571, pl. xlii. fig. 2, *D. tumefacta*, ♀, Port Mackay and Rockhampton, p. 572, pl. xlii. fig. 3, and *E. venusta*, ♂ & ♀, Sydney, p. 574, pl. xlii. figs. 4 & 5, spp. nn.; *D. prætectata*, L. Koch, ♂ & ♀, Upolu, p. 566, pl. xliii. figs. 6 & 7, *D. evanida*, L. Koch, Brisbane, Bowen, Port Mackay, and Rockhampton, p. 569, pl. xlii. fig. 1, and *D. adusta*, L. Koch, ♀, p. 576, pl. xlii. fig. 6, described and figured; *id. l. c.*

Amycle albimaculata, sp. n., ♀, O. P. Cambridge, Ann. N. H. (4) xiv. p. 178, North Australia.

LYCOSIDES.

Ctenus fuscus and *rufus*, Walck. ?, from French Guiana; L. Taczanowski, Hor. Ent. Ross. x. p. 90. *C. giganteus*, ♀, p. 91, Cayenne and St. Laurent de Maroni, and *C. bimaculatus*, ♀, p. 92, Uassa, *id. l. c.*, spp. nn.

Ocyale (?) *spinipes*, sp. n., *id. l. c.* p. 93, ♀, Cayenne and Uassa.

Dolomedes elegans, ♀, p. 86, Cayenne and St. Laurent de Maroni, and *D. longipes*, ♀, p. 88, Cayenne, spp. nn., *id. l. c.*

Lycosa cayennensis, ♂ & ♀, *id. l. c.* p. 84, Cayenne and Iles du Salut; *L. sudetica*, ♀, L. Koch, Abh. Ges. Görl. xv. p. 12 (sep. copy), Niesky; *L. aquilonaris*, *id.* in "Die zweite Deutsche Nordpolarfahrt (Leipzig: 1874, 8vo), ii. Zoologie, pt. 9, pp. 400-403, pl. i. ♂ & ♀, N. E. Greenland: spp. nn.

SPHASIDES.

Oxyopes varians, sp. n., ♀, L. Taczanowski, *l. c.* pp. 95-98, Cayenne, St. Laurent de Maroni and Uassa.

DINOPIDES.

Dinopis guianensis, sp. n., ♂ & ♀, *id. l. c.* p. 98, St. Laurent de Maroni (with observations on the generic affinities).

SALTICIDES.

Attus nigriciliatus, ♂ & ♀, L. Koch, Abh. Ges. Görl. xv. p. 14 (sep. copy), Niesky; *A. volans*, ♂, p. 178, pl. xvii. fig. 4, Sydney, N. S. Wales, and *A. speciosus*, ♂, p. 180, pl. xvii. fig. 5, Swan River, N. S. Wales, O. P. Cambridge, Ann. N. H. (4) xiv.: spp. nn.

Attus napoleon, sp. n. ?, ♂, F. Karsch, Verh. Ver. Rheinl. (3) x. p. 154, pl. i. fig. 6, Westphalia, Prussia [= *falcatus*, Clk., immature], *A. adamsoni*, Sav., found near St. Germain-au-Laye, hitherto unrecorded from France; H. Lucas, Ann. Soc. Ent. Fr. (5) iii. p. 351.

MYRMECHIDES.

Myrmecia bifasciata, sp. n., ♂ & ♀, L. Taczanowski, *l. c.* p. 109, pl. ii. fig. 9, St. Laurent de Maroni.

SCORPIONIDEA.

SCORPIONIDES.

Buthus nigro-carinatus, sp. n., E. Simon, Ann. Soc. Ent. Fr. (5) iv. p. 280, Saint Louis du Sénégal.

Chactas literarius and *haversi*, spp. nn., A. G. Butler, Cist. Ent. pt. xi. p. 323, Soriano, Uruguay.

ARTHROLYCOSIDÆ.

This family suggested for the reception of a new genus and species, *Arthrolycosa antiqua*, from the coal measures of Illinois, with the abdomen divided into 7 segments (approaching *Lipistius desultor*, Schiödte, in which there are 9 horny plates), and in many respects allied to *Protolycosa*, Römer. It is not, however, referred to the true spiders, but considered as representing a group combining features now characteristic of separate groups and embryonic states, bearing relations to the *Phalangidæ* and scorpions in its oculiferous tubercle, and to the scorpions, false scorpions, and *Thelyphonus* in its forcipulate palpi. In general form, it is much like the true spiders, especially the *Mygalidæ*. O. Harger, Am. J. Sci. (3) vii. pp. 219 (fig.)-223.

PHALANGIDEA.

Observations on the morphology and systematic position of the group by W. Sörensen, Nat. Tids. (3) viii. [1873] pp. 489-526. C. Koch's genera of *Gonyleptides* are considered to need revision, the number of tarsal joints, relied on by that author, being variable in the same species. The *Opilionides* and *Trogulides* of C. Koch are united as *Opilionides*, and again sub-divided as *Opilionini genuini* and *Trogulini*. Portions of *Gonyleptes acanthurus*, Dum., *Opilio luridus*, C. Koch, and *Trogulus nepiformis*, Latr., are figured, pl. xv. figs. 1-3. The following new genera and species are characterized (but no differential characters are given):—

Ptychosoma, p. 513. Gonyleptid: *P. vitellinum*, ibid., Bona.

Dicranolasma, p. 516. *Trogulini*: allied to *Nemastoma*; for *Opilio scaber*, Hbst., pl. xv. fig. 6, and ? *Trogulus opilionoides*, L. Koch.

Amopaum, p. 517; *A. spinipalpe*, p. 518, pl. xv. fig. 5, Central Italy.

Anelasma, p. 519; *A. oblongum*, ibid., pl. xv. fig. 4, Bona, *lycosinum*, p. 421, Central Italy.

Trogulus sinuosus, p. 522, pl. xv. fig. 7, *albicerus*, p. 523, Central Italy.

Gonyleptes terribilis, ♂, p. 151, fig. 1, Peru, *G. defensus*, p. 152, fig. 4, Falkland Island, *G. funestis*, p. 153, fig. 5, *G. reedi*, p. 154, fig. 3, and *G. docilis*, p. 154, fig. 2, Chili, spp. nn., A. G. Butler, J. L. S. xii. pl. viii.

Stylocellus, g. n.; *Cyphophthalmides* [scarcely distinguishable from *Cyphophthalmus*, Joseph]. *S. sumatranus*, sp. n., Sumatra; J. O. Westwood, Thesaurus entomologicus oxoniensis (Oxford: 1874), p. 200, pl. xxxvii. fig. 7.

A new family, CRYPTOSTEMMIDES, between the *Cyphophthalmides* and *Trogulides*, formed to receive *Cryptostemma*, Guérin, and *Cryptocellus*, g. n.: body short, depressed; abdomen almost round and smooth, composed of 4 segments; eyes obsolete; mouth-parts concealed by the "labrum"; palpi 4-jointed, terminating with a small claw; legs 8, of moderate length and strength, relative length 2, 3-4, 1, those of 2nd and 4th pairs have the

tarsi 5-jointed, of 1st pair 1-jointed, and of 3rd pair 4-jointed, all the tarsi terminate with 2 claws; the basal joints of the legs coalesce and form a sternum. *C. fædus*, sp. n., pl. xxxvii. fig. 5, Amazons, J. O. Westwood, l. c. p. 201.

Trogulus cambridgii, sp. n., id. l. c. pl. xxxviii. fig. 6, Dorsetshire.

ACARIDEA.

EHLERS, E. Die Kratzmilben der Vögel. Ein Beitrag zur Kenntniss der Sarcoptiden. Z. wiss. Zool. xxiii. [1873] pp. 228-253, pls. xii. & xiii. (An English abstract in Ann. N. H. (4) xiii. pp. 74-76.)

Reviews the literature on the parasitic mites of birds, with especial reference to structure and development. A new genus and species are described, in which the male undergoes no great changes between the larval and adult states, but the female passes through some remarkable transformations.

Bdella arctica, Thor., from Nova Zembla, T. von Heuglin, Reisen nach dem Nordpolarmeer, iii. p. 236.

Sarcoptes scabiei. History and figure; Nat. Canad. ii. pp. 129-139, fig. 19.

Tetranychus lintearius, Duf. A note; H. Lucas, Ann. Soc. Ent. Fr. (5) iii. p. 352.

Hydrachnides occurring in Lake Lemán discussed; H. Lebert, Bull. Soc. Vaud. (2) xiii. pp. 61-68.

Dermatoryctes, g. n., Ehlers, l. c. p. 251. Nearest to *Dermatophagus* and *Dermatocoptes*, Fürstb.; front legs with a small claw near the stalked prehensile disc. *Sarcoptes mutans*, Robin, and *D. fossor*, sp. n., Ehlers, l. c., in the beak of *Munia maia*, pls. xii. & xiii.

Campognatha, g. n., Lebert, l. c. p. 93. Allied to *Attax*, but almost spherical; dorsal stigmata 6, distant, ventral closely approximated, palpi 6-jointed, 3rd joint with one tooth, &c. *C. foreli*, sp. n., id. l. c. pp. 68-94, pls. i. & ii.

Tyroglyphus phylloxerae, sp. n., Riley & Planchon, Rep. Ins. Mo. vi. pp. 52 & 81, fig. 16, parasitic on *Phylloxera* [in anticipation of description of Tr. Ac St. Louis, iii. 1875, p. 215].

Hoplophora arctata, sp. n., C. V. Riley, tom. cit. pp. 53 & 81, fig. 17, parasitic on *Phylloxera* in America [also in anticipation, ut *suprà*, p. 216].

MYRIOPODA.

BY

E. C. RYE, F.Z.S.

MEINERT, F. Myriapoda Musæi Hauniensis. Bidrag til Myriapodernes Morphologi og Systematik. I. Geophili. Nat. Tids. (3) vii. [1870; omitted from Zool. Rec. vii.] pp. 1-128, pls. i.-iv.

The family is thus diagnosed :—Segments numerous, equal; legs short; tarsi entire; antennæ 14-jointed; eyeless; basal plate of head free.

The following genera and species are described (with synonymy):—*Orya*, g. n., p. 14, for *Geophilus barbaricus*, Gerv., pl. i. figs. 1-12. *Orphnæus*, g. n., p. 17, for *O. lividus*, sp. n., p. 19, pl. ii. figs. 6-11, Nicobar Islands, and *O. brasiliensis*, sp. n., p. 20, pl. ii. fig. 12, Rio de Janeiro. *Himantarium gabrielis*, L., pls. i. figs. 13-18, ii. figs. 1 & 2, *rugulosum*, Koch, *subterraneum*, Leach, pl. ii. figs. 3-5, and *H. superbum*, p. 28, and *hispanicum*, p. 29, Spain, *mediterraneum*, p. 29, Algeria and Spain, *dimidiatum*, p. 30, Seville, Madeira, *gracile*, p. 32, Italy, Algeria, Spain, and *filum*, p. 33, Algeria and Spain, spp. nn. *Mesocanthus*, g. n., p. 34, for *M. albus*, sp. n., p. 35, pl. iii. figs. 1-6, Tunis. *Dignathodon*, g. n., p. 36, for *Geophilus microcephalus*, Luc., pl. iii. figs. 13-22. *Scotophilus*, g. n., p. 40, for *S. bicarinatus*, p. 41, pl. iii. figs. 7-11, South Europe and Algeria, *pulchellus*, p. 42, Algeria, and *illyricus*, p. 43, Trieste, spp. nn. *Chatechelyne*, g. n., p. 44, for ? *Geoph. vesuvianus*, Newp., pl. iii. figs. 20-26, and *C. montana*, sp. n., p. 47, S. Tyrol. *Scolioplanes crassipes*, Koch, pl. iii. figs. 12-19, *acuminatus* and *maritimus*, Leach, and *sacolinensis*, sp. n., p. 53, Saghalin. *Schendyla nemorensis*, Koch, pls. iii. figs. 31-34, iv. fig. 1, *eximia*, sp. n., p. 57, pl. iii. figs. 27-30, Bona. *Geophilus sodalis*, Berg. & Mein., pl. iv. figs. 2-9, *foveolatus* and *truncorum*, B. & M., *proximus* and *ferrugineus*, Koch, *longicornis*, Leach, *electricus*, L., and *S. pusillus*, p. 68, Tübingen, Bona, *luridus*, p. 69, Granada, *hispanicus*, p. 70, Spain, *barbaricus*, p. 71, Bona, *sublævis*, p. 72, Brazil, *tyrolensis*, p. 73, Tyrol, *frenum*, p. 74, Bona, *montanus*, p. 74, Carinthia (? = *Arthronomalus hopii*, Newp.), *alpinus*, p. 76, Tübingen, *latro*, p. 79, N. America, New Orleans, *pilosus*, p. 86, Saghalin, *arenarius*, p. 78, *gracilis*, p. 82, *spiniger*, p. 85, pl. iv. fig. 16,

mediterraneus, p. 87, *bonensis*, p. 90, pl. iv. figs. 10-15 (? ? = *Arthronomulus mandibularis*, Luc., *punctatus*, Newp.), Bona: spp. nn. *Mecistocephalus carniolensis*, Koch, pl. iv. fig. 24, *guldingi*, Newp., *punctifrons*, Newp., pl. iv. figs. 17-23, and *M. cephalotes*, sp. n., p. 100, Batavia.

II. Lithobiini. *Op. cit.* (3) viii. [1872] pp. 281-344.

The following genera and species are described (with synonymy) :—*Lithobius punctulatus*, *agilis*, *impressus*, *erythrocephalus*, and *calcaratus*, C. Koch, *mordax*, *fossor*, *bucculentus*, and *crassipes*, L. Koch, *intrepidus*, *borealis*, *microps*, Mein., *forficatus*, Newp., *longipes*, Porath, and *L. imperialis*, p. 289, & *romanus*, p. 296, Rome, *validus*, p. 291, *rheticus*, p. 297, *tenebrosus*, p. 317, *latro*, p. 338, S. Tyrol, *vorax*, p. 292, New Orleans, *tricuspis*, p. 298, Austria, Italy, *granulatus*, p. 299, Montevideo, *obscurus*, p. 300, *insignis*, p. 313, *gracilipes*, p. 318, *hispanicus*, p. 327, *flavus*, p. 336, *gracilis*, *pyrenaicus*, p. 337, & *latebricola*, p. 339, Spain, *rugosus*, p. 306, Oahu, *pulcher*, p. 319, & *bonensis*, p. 320, Algeria, *grossidens*, p. 324, Nicobar Islands, *rapax*, p. 325, Saghalin, *svevicus*, p. 326, Tübingen, *lapidicola*, p. 328, & *eximius*, p. 333, Austria, Spain, Italy, Algeria, *audax*, p. 334, Italy, Tyrol, spp. nn. *Lamyctes fulvicornis*, Mein.

HUMBERT, A., & SAUSSURE, H. DE. *Myriapoda nova Americana*. Series 2. R. Z. (2) xxii. [1870: omitted from Zool. Rec. vii.] pp. 202-205.

The following new genus and species are briefly described :—*Chomatobius*, p. 205 (*Geophilidae*), no differential characters given; for *Geophilus mexicanus*, Sauss., and *C. brasiliensis*, *ibid.*, Brazil. *Scutigera argentina*, p. 202 (no locality mentioned; ? La Plata); *Branchiostoma celer*[e], *ibid.*, Carolina, *scabricauda*, p. 203, Rio Janeiro; *Cormocephalus brasiliensis*, p. 203, Brazil; *Scolopendra californica*, *ibid.*, California, *carinipes*, p. 204, New Granada [= *platypus*, Brandt; A. Gerstäcker, Ber. wiss. Leist. Myriap. &c., 1873, p. 7]; *Scolopocryptops californica*, p. 204; *Notiphilus maximiliani*, p. 205, Mexico.

F. V. Rosicky's paper, SB. böhm. Ges. 1874, on the *Myriopoda* hitherto observed in Bohemia, has not been seen by the Recorder.

A descriptive and anatomical account of the most salient Canadian species; L. Provancher, Nat. Canad. v. (1873) pp. 410-419, figs. 32-35.

Colorado. A. S. Packard, jun., refers to *Lithobius*, *Geophilus*, and *Julus*, in Hayden's Ann. Rep. U. S. Geol. & Geogr. Survey of the Territories for 1873 [Washington: 1874], p. 607. The fauna is nearly identical with that of the Pacific States.

Zephronia lævissima, figs. 4, 4a, 4b, *excavata*, figs. 1, 1a, spp. nn., A. G. Butler, Ann. N. H. (4) xiii. p. 185, pl. xvi. Sikkim.

Spherotherium politum, figs. 2, 2a-c, *maculatum*, figs. 3, 3a, 3b, spp. nn., *id.* l. c. p. 186, pl. xvi. Sikkim.

Peripatus capensis, Grube. Observations on its structure and development by H. N. Moseley, P. R. Soc. xxii. pp. 344-350, from specimens, collected at the Cape of Good Hope, during the 'Challenger' expedition. The opinion of Quatrefages and Gervais as to the affinity of *Peripatus* to the *Myriopoda* is partially confirmed. In many points of habit and tracheal structure it resembles *Julus*, but no structure like that of the heart of *Myriopods* was found in the dorsal vessel. It is certainly not hermaphrodite, and the wide divarication of its ventral nerve-cords prevents its being considered a degenerate form. It has affinities to all the main branches of the *Tracheata*; and the author suggests that the *Myriopods* may be most nearly allied to it, and form a distinct branch arising from it, and not passing through insects. *Peripatus* itself may well be placed among Hæckel's *Protracheata*.

Moseley has subsequently given a more elaborate and illustrated account in Phil. Tr. clxiv. pp. 757-782, pls. lxxii.-lxxv.

INSECTA.

THE GENERAL SUBJECT.

By E. C. RYE, F.Z.S.

BUTLER, A. G. The Zoology of the Voyage of H.M.S. Erebus and Terror, under the command of Captain Sir James Clark Ross, R.N., F.R.S., during the years 1839 to 1843. Insects (conclusion). II. London (E. W. Janson): 1874, 4to, pp. 25-51, pls. vii.-x.

Completes this portion of the work, which has remained unfinished since 1846, and is now perfected by the enterprise of a private individual. The Insects enumerated or described are the completion of the *Orthoptera*, the *Neuroptera*, *Hemiptera*, *Homoptera*, *Hymenoptera*, and *Diptera*, by the late Mr. Adam White, in MSS., and *Lepidoptera*, by Mr. Butler. New genera and species are described and figured; figures also being given of insects already known to science.

GIEBEL, C. G. Insecta Epizoa. Die auf Säugethieren und Vögeln schmarotzenden Insecten, nach Chr. L. Nitzsch's Nachglass bearbeitet. Leipzig: 1874, fo., pp. i.-xv. 1-308, pls. i.-xx. (from Nitzsch's designs).

After a list of Mammals and Birds known to be subject to the attacks of insect-parasites (in each case also named in the list), and a general account of the latter, especially as to their internal anatomy, the *Pediculina* and *Mallophaga* are discussed in detail and figured [infra, *Hemiptera* and *Orthoptera*]. The whole work is based upon Nitzsch's views.

GLOVER TOWNEND. Report of the Entomologist and Curator of the Museum. In Report of the Commissioner of Agriculture for the year 1872, Washington: 1874, 8vo, pp. 112-138, figs. 1-26. Also in the like Report for 1873, Washington: 1874, pp. 152-169, figs. 1-10.

These refer to ravages, &c., caused by a few well-known species. In the preliminary portions of both reports are various scattered observations interesting to American agriculturists, by Watts, Riley, Taylor, Dodge, Peck, and others.

HOLMGREN, A. E. Bidrag till kännedom om Beeren Eilands och Spetsbergens Insekt-Fauna. Sv. Ak. Handl. viii. (1869) No. 5, pp. 1-56 [omitted from Zool. Rec. vi.].

After briefly discussing the plants, mammals, and birds of Beeren

Island, and the insects already known from Spitzbergen, the author tabulates the known insects of Greenland, Spitzbergen, and Beeren Island, as follows:—

	Greenland.		Spitzbergen.		Beeren Island.
<i>Coleoptera</i>	21	.....	0	.....	0
<i>Synistata</i>	2	.....	1	.....	0
<i>Hymenoptera</i>	3	.....	13	.....	1
<i>Lepidoptera</i>	26	.....	1	.....	0
<i>Diptera</i>	26	.....	49	.....	11
<i>Ulonata</i>	1	.....	0	.....	0
<i>Hemiptera</i>	4	.....	0	.....	0
	<hr/> 83		<hr/> 64		<hr/> 12

The following new genus and species are characterized:—

Smittia, p. 47 (*Diptera*: *Chironomidae*). Intermediate between *Dia-mesa* and *Chironomus*; distinguished from both by its short wings. Type, *Chironomus brevipennis*, Boh.

HYMENOPTERA. *Nematus arcticus*, p. 18, Spitzbergen, *Phygadeuon erraticus*, p. 19, Beeren I., *Hemiteles glacialis*, p. 20, *Plectiscus hyperboreus*, *Mesochorus palanderi*, p. 21, *Mesolius leucopygus*, *Bassus arcticus*, p. 22, *Orthocentrus pedestris*, p. 23, *Ichneutes hyperboreus*, p. 25, *Ceraphron spetsbergensis*, p. 25, Spitzbergen. DIPTERA. *Scæva dryadis*, p. 26, *Aricia fuliginosa, denudata*, p. 30, *conspurcata*, p. 31, *illota, paucilla*, p. 32, *ranunculi*, p. 34, Spitzbergen; *Scatomyza nigripes*, p. 34, Beeren I. and Spitzbergen; *Chironomus obscuripes*, p. 38, *ursinus, brevinervis*, p. 39, Spitzbergen, *mimulus*, p. 40, Beeren I., *pumilio*, p. 41, *conformis, obscuripennis, pavidus*, p. 42, *decoratus*, p. 43, *limbatellus*, p. 44, Spitzbergen, *festivus*, p. 43, Spitzbergen and Beeren I., *mixtus*, p. 45, *Dia-mesa hyperborea* and *Tanytus frigidus*, p. 48 Beeren I., *Boletina maculata*, p. 49, *setipennis*, p. 50, *Sciara atrata*, p. 51, *arctica, parva, ecalcarata*, p. 52, *frigida, pallidiventris*, p. 53, *consimilis, abbrevinervis*, p. 54, Spitzbergen.

Other known species are also described. *Hemiteles borealis*, Boh., *nec* Zett., is re-named *septentrionalis* (p. 20); *Aricia labiosa* and *hyperborea*, Boh., = *dorsata*, Zett.; *A. triangulifera*, Boh., *nec* Zett., is re-named *ludibunda* (p. 32); *Scatomyza obscura*, Boh., = *Aricia frontata*, Zett.; *S. hyperborea*, Boh., = *fucorum*, Fall., var.; *Cælopa frigida*, Hal., *nec* Zett., = *eximia*, Stenh.; *Chironomus byssinus*, Stæg., *nec* Schr., is re-named *extremus* (p. 40); *C. productus*, Boh., *nec* Zett., re-named *consobrinus* (p. 44); *C. polaris*, Boh., = *hyperboreus*, Zett.; *C. hyperboreus*, Stæg., = *polaris*, Kby.; *Dia-mesa waltli*, Stæg., *nec* Meig., = *arctica* Boh.; *Trichocera parva*, Boh., = *hiemalis*, Deg.

KRAATZ, G. Ergänzungen und Nachträge zu Hagen's Bibliotheca Entomologica. Erstes Stück. B. E. Z. xviii. pp. 209–226.

Important additions and corrections, referring to 75 different authors. See also corrections in the references to J. G. (not J. C.) Megerle, Fuessly, Rossi, & Stickney, by Schmidt-Göbel, C. H. xii. pp. 149–151.

LE BARON, W. Fourth Annual Report on the Noxious and Beneficial Insects of the State of Illinois. Springfield, U. S. A.; 1874, 8vo, pp. i.-xviii. 1-199, figs. 1-94.

This Report is practically a complete introduction to the study of *Coleoptera*, having a second title, "Outlines of Entomology, published in connection with the author's Annual Reports upon Injurious Insects. Part first. Including the Order of *Coleoptera*." It contains a systematic index, synopsis of tribes, catalogue of authors, especially on N. American beetles, glossary of terms, and index to genera, &c. General observations on insects, and their internal and external structure, collecting and preserving, &c., form the introduction. The *Coleoptera* are discussed by families, and typical species are figured, with essential structural points in detail. The work seems well adapted for its purpose.

LOWNE, B. T. On the structure of the mouths of Insects. Sci. Goss. 1874, pp. 107-110, figs. 76-81.

Continues the observations mentioned in Zool. Rec. x. p. 218.

MÜLLER, HERMANN. Fertilization of flowers by Insects. Nature, ix. pp. 44-46, 164-166, figs. 15-31; x. pp. 129 & 130, figs. 32-40.

In continuation of former papers on the like subject.

NOWICKI, M. Beobachtungen über der Landwirthschaft schädliche Thiere in Galizien im Jahre 1873. Verh. z.-b. Wien, xxiv. pp. 355-376.

Observations on the economy, &c., of insects attacking *Triticum*, *Secale cereale*, *Hordeum*, *Zea*, *Phleum pratense*, *Brassica oleracea*, *Trifolium pratense*, *Napus oleifera*, *Allium*, *Vicia faba*, *Pyrus malus*, *Prunus domestica*, *cerasus*, and *padus*, *Pinus sylvestris*, *Quercus*, *Betula alba*, *Alnus*, *Carpinus*, *Populus*, and *Salix*. [See also Galicia, *infra*, p. 245.]

OUSTALET, E. Recherches sur les Insectes fossiles des terrains tertiaires de la France. (Thèse présentée à la Faculté des Sciences.) Paris: 1874, 8vo, pp. 556, pl. i.-xii.

Reviewed Bull. Soc. Ent. Fr. (5) iv. p. cxc. The work discusses:—I. Fossil insects of Auvergne (*Coleoptera*, *Orthoptera*, *Neuroptera*, *Hymenoptera*, *Diptera*, *Lepidoptera*; 45 species, many new, in 20 known genera); II. Fossil insects, especially *Coleoptera*, of Aix, in Provence (84 species described and figured, of which 54 are new, in 51 genera; including *Erinys*, g. n., of *Pæderides* [*Erinnys*, Schrank, *Lepidoptera*, 1801; J. Thomson, *Coleoptera*, 1857]).

PACKARD, JR., A. S. On the distribution and primitive number of Spiracles in Insects. Am. Nat. viii. pp. 531-534.

From observations upon various *Lepidoptera*, *Hymenoptera*, *Coleoptera*, *Hemiptera*, and *Orthoptera*, and upon *Corydalis*, it would appear that while no more than 10 pairs of spiracles are to be found on the bodies of any one species, yet that 11 segments of the body, in different species taken collectively, bear them; and, as *Campodea* is recorded to have spiracles on each thoracic segment, 11 is probably the normal primitive number of 1874. [VOL. XI.]

pairs. Probably the larvæ of the different groups of winged insects had originally a pair on each thoracic segment; and the ancestral type of lepidopterous larvæ was provided with 2 pairs of thoracic spiracles.

PLATEAU, F. Recherches sur les Phénomènes de la digestion chez les Insectes. Mém. Ac. Belg. xli. [? whole vol. yet published] (also separately, Bruxelles: 1874, 4to, pp. 1-124, pls. i.-iii.).

The digestive apparatus in *Dytiscus marginalis* and larva, *D. dimidiatus*, *Acilius sulcatus*, *Hydaticus transversalis*, *Carabus auratus*, *Libellula conspurcata*, *Æschna grandis*, (pupæ of) *Libellula vulgata*?, *Nepa cinerea*, and *Ranatra linearis*, among the carnivorous insects, and *Hydrous caraboides*, *Hydrophilus piceus*, *Melolontha vulgaris*, *Oryctes nasicornis*, *Locusta viridissima* (in all stages), *Stethophyma grossum*, *Cossus ligniperda* (larva), *Liparis dispar* (larva), *Papilio machaon*, *Vanessa io*, *polychloros*, and *urtica*, among feeders on vegetable matter, is exhaustively discussed, especially with regard to the chemical nature of the various secretions.

The author's chief conclusions are:—that in all insects in a normal state, the digestive juices are alkaline or neutral, never acid; that the gizzard of insects is not a triturating organ, auxiliary to the buccal parts, but allows a gradual and regular passage of alimentary matter, opposing any return from the intestine to the crop; and that the Malpighian tubes are not biliary or urino-biliary organs, but exclusively eliminators of urine.

The plates contain figures of highly magnified portions of the various organs discussed.

PROVANCHER, L. Entomologie élémentaire en rapport avec la faune du Canada. Nat. Canad. ii. [1870] pp. 139-144, 167-174, 210-212, 236-238, 265-268, 297-299, 340-342, 364-367, figs. 23, 25-32, 35; iii. [1871] pp. 21-25, 52-54, 80-87, 132-136, 227 & 228, 258-260, 292-295, 326-329, 357-359, figs. 4, 5, 11-14; iv. [1872] pp. 10-13, 43-47, 68-72, 132-138, figs. 2-4.

The commencement of a general introduction to the study of Entomology, especially as regards external anatomy.

REED, E. C. Catálogo de los Insectos Chilenos. Santiago de Chile: 1874, 8vo, pp. 1-24.

Apparently the commencement of the work, though there is no indication of a future continuation of the present part, which enumerates 357 species of *Coleoptera*: viz., 4 *Cicindelidæ*, 167 *Carabidæ*, 17 *Dytiscidæ*, 3 *Gyrinidæ*, 8 *Hydrophilidæ*, and 148 *Staphylinidæ*. A few new species are indicated. The author criticizes Gay's work adversely, and gives a separate list of his species of *Staphylinidæ*, with their correct names.

RILEY, C. V. Sixth Annual Report on the Noxious, Beneficial, and other Insects of the State of Missouri, &c., Jefferson City, Mo.: 1874, pp. 169 & xii., 55 woodcuts.

Of the usual practical nature.

RONDANI, CAMILLO. Degli Insetti nocivi e dei loro Parasitti. Bull. Ent. Ital. vi. pp. 43-68.

Completes the work, discussing injurious *Diptera*, *Hemiptera*, *Orthoptera*, and *Acaridæ*, and their various insect enemies.

— Nuove osservazioni sugli Insetti fitofagi e sui loro Parassiti fatte nel 1873. *Tom. cit.* pp. 130-136.

Various new species are indicated and named.

WEIJENBERGH, H. *Varia Entomologica*. Tijdschr. Ent. xvii. pp. 149-170, pls. ix. & x.

Observations upon the economy, &c., of various Dutch insects; *Diptera* (*Chironomus*, especially), pp. 150-163; *Hymenoptera*, pp. 163-168; *Lepidoptera*, pp. 168-170. The plates consist of details of the earlier stages of the species discussed.

WESTWOOD, J. O. *Thesaurus entomologicus oxoniensis*; or, Illustrations of new, rare, and interesting Insects, for the most part contained in the collections presented to the University of Oxford by the Rev. F. W. Hope, &c. Oxford (Clarendon Press): 1874, sm. fo., pp. i.-xxiv., 1-205, 40 pls.

Contains an obituary notice of Hope (by T. J. Pettigrew), with a list of his entomological works; and descriptions of various *Coleoptera* (especially *Goliathides*, *Cremastochilides*, and *Paussidæ*), *Hymenoptera*, *Orthoptera*, *Neuroptera*, *Lepidoptera* (including monstrosities), *Hemiptera*, *Achreioptera*, Westw., *Thysanura*, *Anoplura*, and *Arachnida*. The indications of new species, &c., are anything but precise.

WOOD, J. G. Insects abroad, being a popular account of foreign Insects, their structure, habits, and transformations. London: 1874, 8vo, pp. 780, pls. i.-xx., woodcuts.

The title of this book, and the name of its author, sufficiently explain its contents. Mr. Wood has apparently been allowed to examine the cabinets in the British Museum, from which he has in some cases described "new species." Much of the book is taken up by trivial discussions on the meanings of the names of the species noticed.

Embryology and Morphology. C. V. Riley defends his statements that an insect is 13-jointed, and that embryological data do not always subserve the best interests of classification. *Am. Nat.* viii. pp. 181-187. A. S. Packard supports the contrary opinion; *tom. cit.* pp. 187 & 188.

Species known to occur in the later tertiary deposits of Gt. Britain; A. Bell, *Ent.* vii. p. 210.

General observations on antennæ; T. W. Wonfor, *Sci. Goss.* 1874, pp. 29-31.

Noises made by insects; Feuil. Nat., No. 40, pp. 37 & 38, pl. ii. fig. 1. E. Lelièvre, *tom. cit.* p. 58.

Monstrosities in insects and their causes (a double-headed larva of *Chironomus* described [*cf. Zool. Rec.* x. p. 416]); Weyenbergh, *Period. Zool. Argent.* i. pt. 1. J. O. Westwood, *Ent. M. M.* xi. pp. 32-35.

Insect galls produced in Scotland are briefly described by J. W. H. Traill, Scot. Nat. ii. pp. 251-254, 301-305, continuing similar notes.

Insect productions described as Cryptogamic plants; R. McLachlan, quoting M. J. Berkeley, Ent. M. M. x. p. 183.

Myrmecophilous insects. A classified list, with names of the ants in each case; E. André, R. Z. (3) ii. pp. 205-235.

Insects (chiefly *Coleoptera*) devoured by Mammals; Bull. Soc. Ent. Fr. (5) iv. pp. cxxxvii. cxlvii. clxi.

Lists of insects of various orders eaten by hedgehogs, pp. 251 & 252; by moles, pp. 262-264; by shrews, p. 275: P. Tauber, Nat. Tids. (3) viii.

ECONOMIC ENTOMOLOGY. On its importance; C. V. Riley, Am. Nat. viii. p. 189.

Insects capable of being used as vesicants. V. Beguin's Thesis under this title, presented to the École supérieure de Pharmacie, reviewed in Pet. Nouv. vi. p. 429.

M. Girard's "Études sur les Insectes carnassiers utiles à introduire dans les jardins et à protéger contre la destruction" (extr. from Bull. Soc. Acclim., Nos. for Jan. and Dec., 1872), Paris: 1873, 8vo, pp. 1-36, figs. 1-18 [referred to in Zool. Rec. x. p. 221], is sufficiently explained by its title.

"Nature's means of limiting the number of insects." Under this title, A. S. Packard, Jr., gives an account of birds found to eat the canker-worm in America, with general observations on insectivorous birds and other animals. Toads should be collected in large numbers and placed in gardens and orchards. Perris' observations, and Le Baron's suggestions for the transportation of useful parasitic insects, are recapitulated. Am. Nat. viii. pp. 270-282.

On the relations of birds and injurious insects, in connection with the laws of hunting; A. T. Tozzetti, Bull. Ent. Ital. vi. pp. 86-90.

"Common wild Flowers considered in relation to insects." An address by Sir J. Lubbock, at the Belfast meeting of the British Association, 1874, reproduced in Nature, x. pp. 402-406, 422-426, figs. 1-37. These observations are especially in connection with *Hymenoptera*. Cf. also H. MÜLLER, *suprà*; and, on fertilization of *Labiata*, A. W. Bennett, *tom. cit.* p. 92, figs. 1-3; of *Coronilla*, T. H. Farrer, *tom. cit.* p. 169, figs. 1 & 2.

GEOGRAPHICAL DISTRIBUTION. The publication of small local fauna lists advocated; A. de Borre, CR. Ent. Belg. xiv. 1874, pp. xviii.-xxi. Such lists are not trustworthy, owing to the inability of provincials to name captures correctly; A. Fauvel, *l. c.* p. lv. Cf. De Borre, *l. c.* p. lvi. *et seq.*

SPITZBERGEN AND NOVA ZEMBLA. T. von Heuglin, Reisen nach dem Nordpolarmeer (Braunschweig: 1874, 8vo), iii. pp. 236 & 237, briefly refers to *Insecta*. *Chrysomela septentrionalis*, Mén., *Bombus lapponicus*, F., *Anthomyia stigmatica*, Meig., and *Semblis nitida*, Burm. ?, are specified from the latter locality.

LAPLAND. Entomological results of J. Sahlberg's travels communicated by Morawitz, Bull. Ent. Ross. x. pp. xii.-xiv. Some new species are named and characterized.

NORWAY. Fabricius' "Voyage en Norwége," 1779. A list of the species described in this work (6 are not mentioned in the author's subsequent works); L. Reiche, Ann. Soc. Ent. Fr. (5) iv. pp. 541-543.

GREAT BRITAIN. Berwickshire insects noted (No. iii.) by J. Hardy, P. Berw. Club, vii. pp. 324-326.

Cheviot Hills. Contributions to the Entomology of this district (No. v.); *id.* l. c. pp. 328-334.

Lundy Island. Captures by F. Smith, Ent. M. M. xi. p. 111.

FRANCE. Captures at Granville by M. Girard, Bull. Soc. Ent. Fr. (5) iv. p. clxviii.

BELGIUM. Species found at Baudour (Hainault); CR. Ent. Belg. 1874, pp. xci.-xcvi.

GERMANY. F. Reiber, "Les Insectes de la Promenade Lenôtre à Strasbourg," Bull. Soc. Colm. xiv. & xv. p. 467. Observations on species attacking the lime and elm.

E. Hofmann, Württ. Nat. JH. xxx. pp. 299-302, adds some species of *Coleoptera* to Leydig's former Württemberg list, and makes observations on 3 species of *Orthoptera*.

GALICIA. Vols. ii.-viii. (1868-1874) of the publication of the 'Akademija Umiejetności w Krakowie,' entitled 'Sprawozdanie Komisji Fizyograficznej,' published at Cracow, having come to England, the Recorder, to save multiplicity of references, gives here a brief analysis of the contents referring to the *Insecta* (the page sin brackets refer to particular sections in each vol.):—

Vol. II. (1868). M. Nowicki, contributions to the insect-fauna of the Tatra mountains, containing names of species, with localities, in *Coleoptera*, *Neuroptera*, *Diptera*, and *Rhynchota*; pp. (77)-(127). A. Wierzejski, *Hymenoptera*; pp. 108-120. M. Nowicki, *Lepidoptera* occurring at various elevations in the Tatra range, pp. 121-127. T. Zebrawski, *Lepidoptera* (except *Rhopalocera*); pp. 127-129. L. Muszyka, *Lepidoptera* of Cracow; pp. 130 & 131. M. Lomnicki, insects occurring at various elevations; pp. 132-152. J. Dziedzielewicz, *Neuroptera*; p. 153. Various scattered observations; pp. 156-162, 165 & 166.

Vol. III. (1869). Baron Hedemann, *Lepidoptera* of Cracow; pp. 43-49. J. Werchratski, *Lepidoptera* of Podolia; pp. 50-55. W. Jablónski, *Coleoptera* of Cracow; pp. 68-73. M. Nowicki, *Tephritis lusoria*, sp. n., p. (145), Galicia, and *Diptera*, pp. 147-150. J. Werchratski, *Ephemerella albipennis*?, p. 153. P. Schaitter, *Diptera*, p. 153. W. Jablónski, *Cynips*, p. 154. Other observations, p. 150.

Vol. IV. (1870). M. Nowicki, *Diptera*, pp. 3-11, *Coleoptera*, pp. 11-14, *Neuroptera*, p. 14, *Lepidoptera*, &c., pp. 21-23, general observations, pp. 29 & 30, insects injurious to agriculturists (*Chlorops teniopus*, *Agrotis segetum*, *Hadena basilinea*, *Zabrus gibbus*, *Anisoplia onicifera*, *Meligethes aeneus*, *Athalia spinarum*, *Gryllotalpa vulgaris*, *Melolontha vulgaris*, *Agriotes segetis*, *Thamnus 6-notatus*, *Silpha atrata*, *Cephus pygmaeus*, and *Plusia gamma* discussed in detail), pp. 86-163, *Rhynchota*, pp. 237-240. N. Lomnicki, scattered observations on various orders, with list of *Coleoptera*, pp. 41-85. F. Wachtl, *Coleoptera*, pp. 246-262. J. Werchratski, *Lepidoptera*, pp. 263 & 264.

- Vol. V. (1871), no *Insecta*.

Vol. VI. (1872). W. Grzegorzek, *Diptera*, pp. (28)–(56). A. Viertl, *Lepidoptera* and *Coleoptera*, pp. (57)–(69). B. Kotula, *Coleoptera*, pp. (69)–(72).

Vol. VII. (1873). — Boehma, all orders, pp. [179] & [180]. B. Kotula, *Coleoptera*, pp. (53)–(90). W. Kulczyński, *Coleoptera*, pp. (98)–(109).

Vol. VIII. (1874). M. Lomnicki, *Coleoptera*, pp. (12)–(26). A. Wierzejski, *Hymenoptera*, pp. (253)–(273).

ITALY. A. & G. B. Villa, Bull. Ent. Ital. vi. pp. 320–324. A. Dei, *tom. cit.* pp. 424–326. S. Bertolini, *tom. cit.* pp. 329–333.

Captures at Susa in all orders by V. Ghiliani, *tom. cit.* pp. 91–99.

DALMATIA. On Dejean's collections; G. Kraatz, B. E. Z. xviii. pp. 143–145.

CRETE. In V. Raulin's 'Description physique de l'Ile de Crète' (Paris: 1869, 2 vols. 8vo), ii., is a list of 204 species of *Insecta* observed in that island:—*Coleoptera*, pp. 1005–1013, *Orthoptera*, pp. 1013 & 1014, *Rhynchota*, pp. 1014–1016, *Neuroptera*, p. 1016, *Hymenoptera*, pp. 1016 & 1017, *Lepidoptera*, pp. 1017–1019, *Diptera*, p. 1019. References to authors and localities are given, with occasional observations, and the descriptions of new species by Lucas, originally published in R. Z., are reproduced in notes. General observations are made by Lucas, pp. 1019–1021. The fauna is a mixture of that of Constantinople and the Morea and of Italy and South France. The 4 last-mentioned orders have analogies with those of the North of Africa.

AMERICA. Percé, Gulf of St. Lawrence; Nat. Canad. iv. p. 306.

Observations on economic entomology; New England Farmer, n.s., xxix. & xxx. (cf. Pysche. ii. pp. 8 & 11, 102–104), "The Massachusetts Ploughman," xxxiii. (*tom. cit.* pp. 15, 19 & 20). The third Annual Report of the Secretary of the State Pomological Society of Michigan, 1873; Lansing, U. S. A.: 1874 (*tom. cit.* pp. 46 & 47). "Popular Science Monthly" (American), iv. "Scientific American," xx. & xxi. [New York] Tribune Extra, Lecture and Letter Series, No. 21. Pamphlet edn., Hartford Daily Courant, xxxviii. Bulletin of the Torrey Botanical Club, v. (*tom. cit.* pp. 53–56). "The Rural Carolinian," v. chiefly by C. R. Dodge (*tom. cit.* pp. 61–66). American Agriculturist, xxxiii. (*tom. cit.* p. 79). Second and third Reports of State Boards of Agriculture to the Legislature of Kansas, 1873 & 1874 (*tom. cit.* p. 101).

Colorado. Report by W. L. Carpenter of collections made during survey, and especially on the Alpine insect-fauna. The Rocky Mountains form a barrier of great benefit to the agriculturalists of Colorado, effectually preventing the passage of most insects from the plains of Utah. The fauna is nearly identical with that of Mount Washington, Labrador and Alaska; and an altitude of 7000 feet seems to produce the greatest variety of species. Ann. Rep. of U. S. Geol. & Geogr. Survey of the Territories for 1873 [Washington: 1874], part iii. Zoology, pp. 537, 539–542. Galls collected during this survey are briefly described by C. R. Osten-Sacken (*Cynips*, *Nematus*, ? *Pemphigus*, ? *Trypeta*), p. 567.

[Reports on the whole zoological collections also published separately, same pagination. Washington: 1875, 8vo.]

In T. Belt's work, "The Naturalist in Nicaragua" (London: 1874, sm. 8vo), various personal observations on insects and their habits are recorded, especially as regards mimetic analogies (pp. 7, 8, 109, 314-320, 381-385); *Formicidæ* (pp. 17-29, 71-84, 181, 219-229); fertilization of flowers by insects (pp. 70 & 131); wasps (pp. 133 & 157); migratory butterflies and moths (p. 153); insect mortality (p. 181); natural insect-traps (p. 183); ant-cows (pp. 226 & 327). General observations on the insects are made, p. 373; and some characteristic species of Longicorn beetles are mentioned and figured, p. 380.

MUSEUMS, &c. List of Entomological Societies in London; Ent. M. M. x. p. 185.

On public access to collections; A. de Borre, CR. Ent. Belg. 1874, p. cxlvi. Mélièse, Sauveur, Breyer, Sélys-Longchamps; *tom. cit.* pp. clix.-clxvii.

COLLECTING. C. Lallemant, Pet. Nouv. vi. p. 372, recommends a plate of oil placed beneath a lamp. Insects attracted by the light fall into the oil and are asphyxiated [].

Bisulphide of carbon vapour recommended as an effectual agent for killing specimens without injury; W. M. Williams, Nature, ix. p. 162.

NOMENCLATURE. Von Harold is of opinion that the authors of catalogues are in a measure compelled to make changes in the case of double employment of names, and that such changes should not be restricted to monographers; CR. Ent. Belg. 1874, pp. vii. & viii. A. de Borre would leave changes to monographers only; *l. c.* pp. ix.-xii. De Sélys-Longchamps agrees with Harold; *l. c.* p. xiii.

D. Sharp's views [Zool. Rec. x. p. 223] adopted by L. Quaedvlieg; *tom. cit.* pp. xli.-xliv.

On the law of priority and generic types; J. L. Leconte, Canad. Ent. vi. pp. 201-206, 223-226. The author urges resistance to innovation, and denies that any one species represents a genus.

Common names of Insects in Canada; Nat. Canad. iii. pp. 70, 139-141.

"*Dimērus*, n. sp." Under this heading, C. A. Dohrn, S. E. Z. xxxv. p. 86, criticizes a well-known entomologist of Dijon, who is in the habit of distributing lists of species and also of wines for sale.

COLEOPTERA.

BY

E. C. RYE, F.Z.S.

THE GENERAL SUBJECT.

- BERTOLINI, S. DE. *Catalogo sinonimico e topografico dei Coleotteri d'Italia*. Firenze: 1874, pp. 93-156.

Published with Bull. Ent. Ital. vi. This part includes from the *Cucujidæ* to the *Anthicidæ*.

BRANCSICK, CARL. *Die Käfer der Steiermark, systematisch zusammengestellt*. Graz: 1871, 8vo; pp. 114.

Reviewed by Kraatz, B. E. Z. xviii. p. 44.

BRÜGGEMANN, FRIEDR. *Sytematisches Verzeichniss der bisher in der Gegend von Bremen gefundenen Käferarten*. Abh. Ver. Brem. iii. (1873) pp. 441-524.

1650 species noted. *Dryops*, Ol., type *auriculatus* (= *prolifericornis*), adopted for *Parnus*, F., uncharacterized; *Harpalus ferrugineus*, F., nec L., re-named *rufus*; *Olibrus geminus*, Ill., = *testaceus*, Pz.; *Meligethes aeneus*, F., = *brassicæ*, Scop.; *Corynetes ruficornis*, Stm., is not separable from *cæruleus*, Dej.; *Gonioctena 6-punctata*, Pz., nec F., is re-named *fornicata*; *Cassida tigrina*, Deg., = *nebulosa*, L.; *Halysia 12-guttata*, Poda, = *16-guttata*, L., ♀; *Donacia comari*, Suffr., = *discolor*, Pz. For observations on these and other points, cf. Kraatz, B. E. Z. xviii. pp. 123-126 (who thinks Panzer's *Donacia* is *sericea*), and Von Harold, C. H. xii. pp. 145-147.

COX, HERBERT E. *A Handbook of the Coleoptera or beetles of Great Britain and Ireland*. London: 1874, 8vo, 2 vols. (vol. i. pp. i.-viii., 1-527, figs. 1-5, Introduction, *Cicindelidæ*—*Heteroceridæ*; vol. ii. pp. 1-366, *Lucanidæ*—*Stylopidæ*).

This handbook should supply a great want hitherto felt by British Coleopterists, who will however probably regret the author's employment of a classification in some parts at variance with that in use in this country. The work is a compilation of short descriptions (with no localities, synonyms, or references of any kind) arranged on a tabular plan. It is divided under the headings "Normal Coleoptera" and "Aberrant Coleoptera" (*Stylopidæ*); and the sub-divisions of the former are:—*Adephaga*, *Palpicornia*, *Brachelytra*, *Clavicornia*, *Lamellicornia*, *Sternoxi*, *Malacoderma* [!], *Teredilia*, *Rhynchophora*, *Phytophaga*, *Longicornia*, and *Heteromera*. The author follows Seidlitz & Crotch in transferring the *Erotylidæ*, *Coccinellidæ*, and *Endomychidæ* to the *Clavicornes*, and Horn in treating the *Bruchidæ* as *Phytophaga* (without

however making any reference to those or any other writers). The *Edemeridæ* separate the *Rhipidophoridæ* and *Meloidæ* from the *Stylopidæ*.

The Introduction contains general observations on collecting, &c., and a slight account of the external anatomy of beetles, illustrated by figures of the most conspicuous parts, taken from the *Carabidæ*.

FAUVEL, A. *Annuaire Entomologique pour 1874*. Caen : 1874, 12mo, pp. 140.

On the same plan as the first vol. [Zool. Rec. x. p. 226].

GEMMINGER, MAX, & HAROLD, E. VON. *Catalogus Coleopterorum hucusque descriptorum synonymicus et systematicus*, xi. pp. 3233-3478 [*Chrysomelidæ*, pt. 1]. Munich: 1874, 8vo.

296 genera and 5477 species enumerated. Corrections and additions to vol. ix. by G. R. Crotch, C. H. xii. pp. 91-93; to vols. iii. & iv. by v. Harold, *tom. cit.* pp. 93-96; to vols. viii. & ix. by Gemminger, *tom. cit.* pp. 96 & 97.

PROVANCHER, L. *Petite Faune Entomologique du Canada*. Nat. Canad. iv. (1872) pp. 164-171, 197-200, 236-240, 261-264, 292-299, 327-331, 359-361; v. (1873) pp. 12-16, 51-55, 353-359, 391-395, 404-409, 467-469; vi. (1874) pp. 48-55, 72-77.

Commences a proposed descriptive account of Canadian insects by discussing the *Coleoptera* (after a general introduction). The *Cicindelidæ*, *Carabidæ*, *Silphidæ*, *Staphylinidæ*, *Histeridæ*, and *Scaphidiidæ* only are characterized in the above portions; and, from a notice at p. 68 of vol. vi., it seems intended to complete the work in a separate form.

SAHLBERG, JOHN. *Enumeratio Coleopterorum Carnivororum Fenniciæ*. Not. Fenn. xiv. 1873 [but dated "December, 1874," p. 200], pp. 1-200.

A descriptive account of the *Cicindelidæ*, *Carabidæ*, and *Dytiscidæ* of Finland, divided into 14 provinces. Some new species are described.

SCHJÖDTE, J. C. *Fortegnelse over de i Danmark levende Silpher, Scaphidier, Ptilier, Scydmaner, og Pselapher*. Nat. Tids. (3) vii. [1870] pp. 187-216. *Hydrophili*, *tom. cit.* [1871] pp. 523-530. *Histri*, *l. c.* pp. 531-538. *Malacodermi*, *Cleri*, *Ptini* og *Anobia*, *op. cit.* viii. [1872] pp. 1-22. *Heteromere Eleutherater*, *l. c.* pp. 23-46. *Curculiones*, *l. c.* pp. 47-110. *Chrysomelæ*, *Erotyli*, *Endomychi* og *Coccinellæ*, *l. c.* pp. 111-159.

An enumeration of the Danish species in the groups mentioned, with short bibliographical and local references. Additions are made to former lists of *Carabidæ* by the author, *op. cit.* viii. p. 160; to the *Dytiscidæ*, *op. cit.* vii. p. 539; and to the *Coleoptera* generally, *op. cit.* viii. pp. 482-488.

—. *De Metamorphosi Eleutheratorum Observationes*. Bidrag til Insekternes Udviklingshistorie. Pt. 5, pls. 42-50, *op. cit.* viii. [1872] pp. 165-226, pls. i.-ix. Pt. 6, pls. 51-53, *tom. cit.* [1873] pp. 545-564, pls. xviii.-xx. Pt. 7, pls. 54-58, *op. cit.* ix. [1874] pp. 227-376, pls. viii.-xix.

Continues the author's elaborate descriptions of larvæ (to be noticed *seriatim, infra*). The last part mentioned in Zool. Rec. [vii. p. 249] was the beginning of the 4th (*Buprestidæ*), of which the concluding part is contained in Nat. Tids. (3) vi. pp. 467-536, pls. iii.-x., not seen by the Recorder.

The legs of the larvæ of beetles are 6-jointed, with exserted tarsi, which are provided with muscles, or 5-jointed, with a solid terminal joint. Of the former type, *Cicindela*, the *Carabi*, and *Pelobius*, have "mandibulæ clauseæ," which in the last-named have no "retinaculum"; in *Halipus* and *Cnemidotus*, the *Dystici* and *Gyrini*, the mandibles are suctorial, and the ocelli six in number.

SEIDLITZ, GEORG. Fauna Baltica. Die Käfer (Coleoptera) der Ostseeprovinz Russlands. Dorpat: 1874, 8vo; Lieferung iii. pp. 49-80 (generic table), 209-340.

Comprises the end of the *Anisotomidæ*, the *Silphidæ*, *Scydmanidæ*, *Pselaphidæ*, *Staphylinidæ* and *Dascillidæ* (*Gymnusa* and *Atopa* meeting), and part of the *Telephoridæ*. 3 new species are described.

SHARP, D. The Coleoptera of Scotland. Scot. Nat. ii. pp. 233-240, 285-288, 329-336, 377-384.

Continues former lists; *Homalota* (part) to *Othius*.

SOLSKY, S. In A. Fedchenko's Puteshestvie v Turkestan [Travels in Turkestan]; Zoogeographicheskia Izsledovania, Series 5, vol. ii. part 5. Jestkokrilia (*Coleoptera*), fasc. 1, pp. 1-222. St. Petersburg and Moscow: 1874, 4to.

The work of which the above is the separate title, is issued in the "Izvestia Imperatorskaio Obschestva liubitelei Estestvoznania, Antropologii, i Etnographii" [Publications of the Imperial Society of Amateurs of Natural History, Anthropology, and Ethnography: = Nachr. Ges. Mosc.] of Moscow, series 5, vol. xi., and commences a discussion of the species observed by the late A. Fedchenko in his explorations of Turkestan (*Cicindelidæ*-*Scaphidiidæ*). A new genus and many new species are characterized, the diagnoses being in Latin. The author's remarks cannot be here abstracted, being in Russian. References are made to a plate not published with this fasciculus.

STEINHEIL, EDOARDO. Symbolæ ad historiam Coleopterorum Argentinæ meridionalis, ossia enumerazione dei coleotteri raccolti dal Prof. P. Strobel nell' Argentina meridionale, e descrizione delle specie nuove (Traduzione dal manoscritto tedesco inedito par P. Strobel, coll' aggiunta delle notizie sulla dimora delle specie). II. Centuria. Atti Soc. Ital. xv. (1872, published in 1873) pp. 554-578 [Zool. Rec. vi. p. 194].

Local Notices.

SPITZBERGEN: A. E. Eaton, P. E. Soc. 1874, p. vi.

GREAT BRITAIN. Shetland Isles (including varieties): T. Blackburn,

Ent. M. M. xi. p. 112. A fuller account; *id.* & C. E. Lilley, Scot. Nat. ii. pp. 346-349.

Orkney: J. B. Syme, Scot. Nat. ii. p. 204.

Scotch varieties: T. Blackburn, Ent. M. M. x. p. 252.

Inverness-shire: G. C. Champion, Ent. M. M. xi. p. 64.

N. Wales: J. Chappell, Ent. M. M. xi. p. 15.

Kent: J. J. Walker, Ent. M. M. x. p. 252, xi. p. 37.

EAST FRIESLAND: E. Everts, Tijdschr. Ent. xvii. Versl. p. lxiv.

GERMANY. Species new to the fauna-list; W. Scriba, B.E.Z. xviii. p. 136.

Mecklenburg Schwerin: Brauns, B. E. Z. xviii. pp. 127 & 128 (150 *Trichonyx mærkeli* with red ants, in a garden).

Maritime species now occur at lakes near Erdeborn which have recently become salt; M. von Hopffgarten, B. E. Z. xviii. p. 137.

Rhine. C. Fuss, Verh. Siebenb. Ver. xxi. (1871) pp. 18-21, adds 61 species, with notices of localities, &c., to his former list in Arch. Ver. Siebenb. Landkunde u. s. w. viii. (1869). Two new species are referred to.

Alsace and the Vosges: new and rare species noted by F. Reiber, Bull. Soc. Colm. xiv. & xv. p. 467. Supplementary to the Catalogue of Wencker & Silbermann.

FRANCE Captures by A. Fauvel, interesting for fauna of Cotentin; Bull. Soc. L. Norm. (2) viii. pp. 440 & 495.

St. Quentin: Bull. Soc. L. N. Fr. ii. pp. 239 & 240.

Montluel, Izeron, Balbigny, La Verpillière, St. Quentin; Siméan, Bull. Soc. Sci. Lyon, i. pp. 8, 9, 10, 11, 21, 22.

Forest of Longboel and Valley of Andelle (Eure); T. Lancelevée, Feuil. Nat. 1874, pp. 63-66, 117-120.

Lhôme, near Paris: Bedel, Bull. Soc. Ent. Fr. (5) iv. p. clxxiv.

Maine and Loire: Gallois, Bull. Soc. Angers, iii. (1873) p. 67, continues his entomological fauna-list (*Coleoptera*). Species noticed at Baugé; *id. tom. cit.* p. 54.

Allier and Puy-de-Dôme: Desbrochers, Bull. Soc. Ent. Fr. (5) iv. pp. ccxii.-ccxv.

Belley (Dép. de l'Ain): Feuil. Nat. 1874, pp. 83 & 84.

Languedoc: Marquet, Bull. Soc. Toulouse, 1873, continues his catalogue of the species found in this district [Zool. Rec. x. p. 230], *Dytiscidæ*—*Pselaphidæ*.

Landes. A catalogue of *Coleoptera* commenced by E. Gobert, Bull. Soc. Toulouse, vii. p. 295 *et seq.* 280 species are included in the first part, which does not conclude the *Carabidæ*. Details of habits, time of appearance, rarity, &c., are given.

SPAIN. Synonymy of species described or mentioned in L. v. Heyden's "Entomologische Reise" [Zool. Rec. vii. p. 239], with remarks on other Spanish beetles, by S. Uhagon (quoting Heyden); Act. Soc. Esp. iii. pp. 63-65.

Mountains in the North of Granada: captures by Thevenet, Bull. Soc. Ent. Fr. (5) iv. p. lxi.

ITALY. Valley of Pesio: species found during an excursion in 1873 by Eugenio Sella, Bull. Ent. Ital. vi. pp. 82²-84⁴.

Trento : St. Bertolini, *tom. cit.* pp. 99-102.

Rocca d'Orcia : L. V. Bandi, *tom. cit.* pp. 147-150.

Vesuvius : L. Palmieri's observations on *Coccinella 7-punctata*, *Chrysomela populi*, and other insects found in numbers, dead, after an eruption, quoted by M. V. Hopffgarten, B. E. Z. xviii. p. 138.

Apennines : D. Lorenzini, Bull. Ent. Ital. vi. p. 327.

Palermo. Calendar of captures ; E. Ragusa, *tom. cit.* pp. 302-312.

DALMATIA. F. Dirnböck, B. E. Z. xviii. pp. 139-142.

RUSSIA. Species observed at Derbent ; A. Becker, Bull. Mosc. xlviii. pt. 1, p. 217.

TURKEY. Captures near Constantinople by Clair ; Bull. Soc. Ent. Fr. (5) iv. p. lxxxiv.

AFRICA. Algerian Sahara : (Thiébauld) L. Fairmaire, Pet. Nouv. vi. p. 407.

Abyssinia : Raffray's explorations reported, Pet. Nouv. vi. p. 375.

JAPAN. 82 species noted as common to Europe (63 British ; 17 probably imported). Nearly 2000 species are now known from Japan, including about 1500 in course of description. G. Lewis, Ent. M. M. x. pp. 172-175.

N. AMERICA. Portneuf, Quebec. List of species, Nat. Canad. i. p. 256, ii. pp. 12, 60, 118, 178, 249, 276, 343, iii. pp. 25, 57.

Anticosti : W. Cowper, Canad. Ent. vi. pp. 137 & 138.

Cliftondale, Massachusetts : S. Henshaw, Psyche, i. pp. 17 & 18, 22 & 23.

Colorado. List of species taken by W. L. Carpenter ; H. Ulke, in Hayden's Ann. Rep. U. S. Geol. & Geogr. Survey of the Territories for 1873 [Washington : 1874, 8vo], pp. 567-570. Notes by Carpenter, *l. c.* pp. 570 & 571.

Mt. Washington : A catalogue of species taken, by E. P. Austin, P. Bost. Soc. xvi. pp. 265-272. Some new species are described by J. L. Leconte in an appendix.

Louisiana, Lake Pontchartrain : Catalogue by S. V. Summers, Bull. Buff. Soc. ii. pp. 78-99.

St. Louis County, Missouri : List of *Coleoptera* continued by S. V. Summers, Canad. Ent. vi. pp. 52-55 (*Stenidæ*—*Colydiidæ*).

Cave beetles. Account of an excursion to the caves of St. Giron, Ariège ; L. Gavoy, Feuil. Nat. 1874, pp. 70-73. Marquet, Bull. Soc. Toulouse, vii. p. 322.

Ant's nest beetles : notes on collecting and instruments useful, with a list of species occurring in the valley of Andelle (Eure) ; T. Lancelevée, Feuil. Nat. 1874, pp. 25-27. Cf. also André, *suprà*, p. 244.

Larvæ of beetles (*Necrophilus*, *Lampyris*, *Procrustes*) found in snail-shells ; G. Jäger, "Deutschlands Thierwelt" (Stuttgart : 1874, 8vo) i. p. 94.

Instances of adaptability of colour of species to their food plant ; W. L. Carpenter, in Hayden's Report [*suprà*], p. 571.

Monstrosities and varieties. Suffrian, S. E. Z. xxxv. pp. 114-120, describes abnormal specimens (from his own collection) of *Procrustes coriaceus*, *Carabus nitens*, *Calosoma sycophanta*, *Anchomenus 6-punctatus*, *Dytiscus latissimus*, *Necrophorus germanicus* and *mortuorum*, and *Silpha rugosa*.

Beetles imported in timber; J. Gardner, Ent. M. M. xi. p. 135.

Collecting. Fettig, Pet. Nouv. vi. p. 403, recommends linen sheets spread on grass, and turned and examined at mid-day. A cloth fastened to the tree at each end by a pin recommended for use, when bark insects are being collected; R. Valette, CR. Ent. Belg. 1874, p. xlvi. Crumpled paper forms a good trap; C. Lallemant, Pet. Nouv. vi. p. 368. Collecting detritus during inundations recommended; H. J. de Heylaerts, *ibid.*

Notes on Wesmael's collection; GR. Ent. Belg. 1874, p. cxliv.

Kraatz's attempts to identify certain of Beck's species [Zool. Rec. x. p. 228] are ridiculed by Breyer; *tom. cit.* pp. xiv.-xviii.

Nomenclature. J. L. Leconte, Canad. Ent. vi. pp. 186-196, discusses changes proposed in the names of N. American *Coleoptera* by the late G. R. Crotch, in his "Check List." These he repudiates, accepting the limit of time (1766) fixed by Rule iii. of the British Association Code, 1842. A tabulated list is given of the genera of Geoffroy, Linnæus, Fabricius, Olivier, and Latreille. Cf. also *tom. cit.* pp. 201-206, 223-226. Crotch's arrangement is also criticized in Pet. Nouv. vi. p. 428; observations thereon by D. Sharp, *tom. cit.* p. 431. G. H. Horn, *tom. cit.* p. 436, repudiates Crotch's alterations of names, but considers his classification very near the truth: E. Deyrolle, *tom. cit.* p. 437, demurs to some of its salient features.

CICINDELIDÆ.

G. Pellet, Bull. Soc. Pyrén. xx. (1873) pp. 1-32, discusses the species found in the department of the Eastern Pyrenees.

List of species found by C. V. Volxem in Portugal; J. Putzeys, Ann. Ent. Belg. xvii. pp. 46 & 47.

Twelve Canadian species noted; L. Provancher, Nat. Canad. ii. p. 221.

Chilian species enumerated by E. C. Reed, P. Z. S. 1874, pp. 48-52. *Cicindela gormazi*, Reed, is additionally characterized and figured, and a var. described; p. 52, pl. xiii. fig. 3.

Cicindela suturalis, F., and *hebræa*, Kl., doubtfully considered as distinct; J. Putzeys, l. c. p. 117. The two are always met with in company, and the ♂ of the first seen *in cop.* with ♀ of the second; J. Purves, *tom. cit.* p. 119.

Cicindela maritima and *hybrida* considered conspecific; J. Bourgeois, Pet. Nouv. vi. p. 436 [this observer appears only to be aware of the colour differences of the two species].

Prionyssa, g. n., H. W. Bates, Ent. M. M. x. p. 267. 4 anterior legs with dilated tarsi in ♂; differs from *Heptodonta* in its very long labrum, which has only 5 very strong teeth. General facies of *Pentacomia*. *Pr. nodicollis*, sp. n., *id. ibid.*, Darjeeling.

Omus sequoiarum, Sierra Nevada, *edwardsi*, Lake Tahoe, spp. nn., G. R. Crotch, Tr. Am. Ent. Soc. v. p. 73.

Megacephala excelsa, sp. n., H. W. Bates, l. c. p. 261, E. Africa.

Tetracha fuliginosa, sp. n., *id. ibid.*, Nicaragua.

Oxychila gratioiosa, sp. n., *id. l. c.* p. 262, New Granada.

Cicindela igneicollis, p. 262, W. Australia, *hilariola*, p. 263, N. Persia, *nebulosa*, *ibid.*, *chontalensis*, p. 264, Nicaragua, *wallacii*, p. 264, Celebes, *granulipennis*, Ecuador, *cathaica*, Hong Kong, *delicata*, New Guinea, p. 265, *immanis*, p. 266, Yemen, *id. l. c.*; *C. wakefieldi*, *id. Ann. N. H. (4) xiii.* p. 234, New Zealand; *C. maracandensis*, p. 3, Maracand, *sublacerata*, p. 8, Kokand, S. Solsky, Fedchenko's Turkestan, ii. 5: spp. nn.

Odontochila salvini, p. 267, Panama, *rufiscapis*, p. 268, Ecuador, *nicaraguensis*, p. 269, Nicaragua, H. W. Bates, Ent. M. M. x.: spp. nn.

Therates erinns, sp. n., *id. l. c.* p. 269, N. Borneo.

CARABIDÆ.

Nebria complanata, p. 178, pl. i. figs. 1 & 2; *Pterostichus striola*, p. 179, pl. i. figs. 3-8; *P. ovalis*, Duft., p. 180; *Licinus brevicollis*, pp. 181-185, pl. ii. figs. 1-13 (pupa, p. 185); *Badister bipustulatus*, pp. 186-189, pls. i. figs. 9 & 10, ii. figs. 1-5; *Panagæus cruz-major*, pp. 189-193, pl. iii. figs. 6-13; *Dromius agilis*, pp. 194-197, pl. iv. figs. 1-10; *D. 4-maculatus*, pp. 197 & 198, pl. iv. fig. 11; larvæ elaborately described and figured by Schiödte, Nat. Tids. (3) viii. [1872].

List of species (4 new) found by C. V. Volxem in Portugal; J. Putzey, Ann. Ent. Belg. xvii. pp. 48-60.

Species found by J. Purves in Antigua; *id. l. c.* pp. 118 & 119.

Chilian species enumerated (some new); tropical and sub-tropical forms are absent; many of Putzey's species are possibly not Chilian; one of that author's localities 'Pampas de Chili,' is erroneous, there being no Pampas in Chili. E. C. Reed, P. Z. S. 1874, pp. 52-70, pl. xiii.

89 species of Geodephagous Coleoptera are now known from New Zealand. Of the 37 genera, 14 are peculiar to the islands, 8 Australian, 2 Chilian, 7 common to New Zealand and the north temperate zone, and the rest doubtful. H. W. Bates, Ann. N. H. (4) xiii. pp. 233.

Elaphridæ.

Notiophilus 4-punctatus. On its specific value; E. C. Rye, Ent. Ann. 1874, p. 75.

Diachila (Blethisa) polita, Fald., from Russian Lapland, new to Europe; J. Sahlberg, Not. Fenn. xiv. p. 71.

Notiophilus sublaevis, sp. n., S. Solsky, Fedchenko's Turkestan, ii. 5, p. 11, Sarafschan Valley.

Carabides.

Carabus nitens, L., [unnecessarily] renamed *pulchellus*; F. Brügge-mann, Abh. Ver. Brem. iii. p. 451.

Carabus auratus, black variety from Dijon. H. de la Cuisine, Feuil. Nat. 1874, p. 136.

Carabus buqueti, var. n. *elegantissimus*, from S. Chili; E. C. Reed, P. Z. S. 1874, p. 53, pl. xiii. fig. 5.

Nebria psammophila, p. 12, *limbigera*, p. 13, S. Solzsky, Fedchenko's Turkestan, ii. 5, Kokand; *N. taygetana*, p. 325, Mt. Taygetus, *hybrida*, p. 326, Rhilo Dag, A. v. Rottenberg, B. E. Z. xviii.; *N. vanvolzemi*, J. Putzeys, Ann. Ent. Belg. xvii. p. 49, S. Portugal; *N. lewisi*, p. 22, Japan, *elliptipennis*, p. 22, & *crassiceps*, p. 23, Kurdistan, H. W. Bates, Ent. M. M. xi.: spp. nn.

Leistus expansus, sp. n., Putzeys, l. c. p. 50, S. Portugal.

Carabus fedtschenkoi, p. 14, Maracand, *stschurovskii*, p. 15, Sarafschan Valley, *kaufmanni*, p. 16, Ura-tübe Mountains, Solzsky, l. c.; *C. mochaë*, Reed, l. c. p. 54, pl. xiii. fig. 4, Island of La Mocha, Chili: spp. nn.

Callisthenes usgentensis, sp. n., Solzsky, l. c. p. 20, Usgent.

Cychrides.

Cychrus angulicollis, E. Sella, Bull. Ent. Ital. vi. p. 82*, pl. ii. fig. 2, Valley of Pesio; *C. mimus*, G. H. Horn, Tr. Am. Ent. Soc. v. p. 20, California: spp. nn.

Pamborides.

Tefflus raffrayi, p. 376, Abyssinia, *juvenilis*, p. 377, E. Africa; Chaudoir, Pet. Nouv. vi.: spp. nn.

Scopodides.

Scopodes aterrimus, sp. n., H. W. Bates, Ann. N. H. (4) xiii. p. 276, New Zealand.

Galeritides.

Zuphium microphthalmum, sp. n., J. Putzeys, Ann. Ent. Belg. xvii. p. 51, Tangiers.

Lebiides.

Coptodera incerta, Sol., = *ænescens*, Mots., = *Dromius æneus*, Dej., = *Crossonychus viridis*, Dej.; *Oxoides obscurus*, Sol., ? = *Dromius sulcatus*, Sol., ♂; *Axinopalpus*, Lec., = *Variopalpus*, Sol.; *Omostenus maculipennis*, Sol., is ? a *Dromius*; *Mimodromius*, Chaudoir, characterized, and *Callida nigrifasciata* and *guttula*, Sol., and ? *Dromius pictus*, Sol. (from the Argentine Pampas), referred to it; E. C. Reed, P. Z. S. 1874, pp. 67-70.

Dromius vectensis, Rye, figured; Ent. Ann. 1874, frontisp. fig. 7.

Dromius 4-maculatus; var. with upper and lower spots confluent; E. A. Waterhouse, Ent. M. M. x. p. 251.

Cyanotarus, g. n., Reed, l. c. p. 70. Differs from *Cymindis* in the thicker posterior part of the head, more elongate, cordate thorax, rounder shoulders, short metasternum, and hairy palpi. Type, *Dyscolus andinus*, Germ., l. c. pl. xiii. fig. 2.

Glycia flavipes and *bicolor*, p. 35, Maracand, *anthracina*, p. 36, Siberia, S. Solzsky, Fedchenko's Turkestan, ii. 5: spp. nn.

Tetragonoderus intermedius, Solsky, *l. c.* p. 45, Maracand; *T. latipennis*, J. L. Leconte, Tr. Am. Ent. Soc. v. p. 44, Texas: spp. nn.

Mimodromius philippii, sp. n., Reed, *l. c.* p. 68, pl. xiii. fig. 1, Chillan.

Variopalpus crusoidii, sp. n., Reed, *l. c.* p. 69, Juan Fernandez.

Ozænides.

Ozæna magna, p. 23, Upper Amazons, *brevicornis*, p. 24, Peru, spp. nn., H. W. Bates, Ent. M. M. xi.

Pachyteles setifer, p. 25, Ecuador, *goniaderus*, *undulatus*, p. 25, *fuscus*, p. 26, *sulcipennis*, p. 27, Ega, *tapajonus*, R. Tapajos, *peruvianus*, Peru, p. 26, *aspericollis*, p. 27, Tunantins, *fuliginellus*, p. 28, Nicaragua, spp. nn., *id. l. c.*

Siagoniides.

Coscinia pictula, sp. n., *id. l. c.* p. 95, Mesopotamia.

Ditomides.

Kraatz, B. E. Z. xviii. pp. 235 & 235, reviews Brûlerie's Monograph, criticizing also the synonymic observations on *Bembidium* and *Pristonychus* thereto annexed [Zool. Rec. x. pp. 236 & 244].

Carenochyrus, g. n., S. Solsky, Fedchenko's Turkestan, ii. 5, p. 49. Allied to *Chilotomus*, Chaud. *Car. titanus*, sp. n., Solsky, *l. c.* p. 50, Taschkent.

Aristus tenuisculptus, sp. n., *id. l. c.* p. 47, Sarafschan Valley.

Apotomus xanthotelus, sp. n., H. W. Bates, *l. c.* p. 95, Celebes.

Scaritides.

Pasimachus. Notes by J. L. Leconte, Bull. Buff. Soc. i. pp. 266-273. Eleven species are recognized and described (one new), with synonymy.

Dyschirius thoracicus, Ill., var. n. *lapponicus*, from Lapland; J. Sahlberg, Not. Fenn. xiv. p. 66.

Teratidium, g. n., H. W. Bates, *l. c.* p. 100. Agrees with *Monocentrum* in wanting the usual supra-apical teeth in the anterior tibiae, but the apical joint of the palpi is excessively dilated, and the frontal grooves are very short and faint. *T. macros[-crum]*, sp. n., *id. ibid.*, W. Australia.

Pasimachus strenuus, sp. n., Leconte, *l. c.* p. 267, Florida.

Carenum porphyreum, p. 95, *breviforme*, *subplanatum*, p. 96, *planipenne*, p. 97, spp. nn., H. W. Bates, *l. c.*, W. Australia.

Neocarenum cylindripenne and *retusum*, spp. nn., *id. l. c.* p. 98, W. Australia.

Eutoma cavipenne[-nis], sp. n., *id. l. c.* p. 99, W. Australia.

Carenidium sapphirinum, sp. n., *id. ibid.*, W. Australia.

Dyschirius ovicollis, S. Solsky, Fedchenko's Turkestan, ii. 5, p. 57, Kisil-kum Desert; *D. (?) strigifrons*, L. Fairmaire, Pet. Nouv. vi. p. 407, Algerian Sahara: spp. nn.

Panagæides.

Panagæus 4-pustulatus; var. with central transverse fascia interrupted; E. C. Rye, Ent. Ann. 1874, p. 62, frontisp. fig. 8 [cf. Zool. Rec. x. p. 210].

Chlœniides.

The species of *Lachnocrepis*, *Anatrichis*, *Oodes*, and *Eoolenes* found in Louisiana briefly described; S. V. Summers, *Canad. Ent. vi.* pp. 135 & 136.

Chlœnius semicyaneus, sp. n., S. Solsky, *l. c.* p. 65, Maracand.

Licinides.

Badister brevicollis, sp. n., L. Reiche, *Ann. Soc. Ent. Fr. (5) iv.* p. 544, Caramania.

Dicrochile subopaca, p. 237, *aterrima*, p. 238, spp. nn., H. W. Bates, *Ann. N. H. (4) xiii.* New Zealand.

Cnemacanthides.

Odontoscelis curtisi, Waterh., = (*Cnemalobus*) *darwini*, Wat.; *C. sulciferus*, Phil., *abbreviatus*, *gayi*, and *germaini*, Putz., *cyathicollis*, Sol., *cyaneus*, Brullé, *Baripus aterrimus*, Chaud., *O. tentyrioides*, Curt., and ? *O. striatus* and *substriatus*, Waterh., = *C. obscurus*, Brullé; E. C. Reed, *P. Z. S. 1874*, p. 56.

Mecodema rectilineatum, Putz., = *howitti*, Cast.; H. W. Bates, *l. c.* p. 236.

Anisodactylides.

Anisodactylus rufus, Brullé, differs from *Anisotarsus*, having the head as in *Geopinus*; it may be a *Cylloscelis*. E. C. Reed, *l. c.* p. 62.

Lecanomerus marginatus, id. *l. c.* p. 62 (? = *Nema[to]glossa brevis*, Sol.), S. Chili; *L. latimanus*, H. W. Bates, *l. c.* p. 271, New Zealand: spp. nn.

Trachysarus, g. n., Reed, *l. c.* p. 62. Anterior and intermediate tarsi of ♂ with 4 basal joints moderately dilated, the 4th sub-bilobed, and all furnished beneath with a brush of short scaly hairs, not in pairs, as in the true *Harpali*, nor as a fine even brush, as in the *Anisodactyli*. *Acupalpus pallipes*, Germ. (*l. c.* pl. xiii. fig. 6), and *T. antarcticus*, sp. n., id. *l. c.* p. 63, Valdivia.

Triplosarus, g. n., H. W. Bates, *Ann. N. H. (4) xiii.* p. 270. Allied to *Phorticosomus* and *Cratacanthus*, but with prominent eyes, frontal suture sharply impressed with a deep foveola near each end, and paraglossæ lateral. *T. fulvescens*, sp. n., id. *l. c.* p. 271, New Zealand (? = *Harpalus novæ-zelandiæ*, Cast.).

Migadops bimaculatus, sp. n., E. C. Reed, *P. Z. S. 1874*, p. 52, pl. xiii. fig. 7, Chili.

Dichirotrichus microderus, sp. n., S. Solsky, Fedchenko's Turkestan, ii. 5, p. 72, Maracand.

Harpalides.

Clouds of *Harpalus griseus* and *calceatus* near Paris; J. Fallou, *Bull. Soc. Ent. Fr. (5) iv.* p. cxlix. *H. luteicornis* not British; E. C. Rye, *Ent. M. M. x.* p. 229. *H. latus*, var. n. *metallescens*, S. Coast of England; id. *op. cit.* xi. p. 84. *H. calathoides* and *amariformis*, Mots., ? = *anxius*, Duft., local races; *H. obtusus*, Gebl., = *borysthenicus*, Kryn.; and 1874. [VOL. XI.]

observations are made on other species from Sarepta; G. Kraatz, B. E. Z. xviii. pp. 299 & 300.

Paramecus parallelus, Chaud., and *niger*, Cast., = *laevigatus*, Dej.; *Acupalpus impressifrons*, *ruficollis*, *unistriatus*, *tibialis*, *chilensis*, and *arcobasis*, Sol., belong to *Bradycellus*. E. C. Reed, P. Z. S. 1874, pp. 61-64.

Euthenarus, g. n., H. W. Bates, Ann. N. H. (4) xiii. p. 272. Resembles *Bradycellus* and *Stenolophus*, but with the 4 dilated palms of the ♂ clothed with a few very long linear hair-scales, set obliquely, and forming a broad fringe. *E. brevicollis* and *puncticollis*, spp. nn., *id. l. c.* p. 273, New Zealand.

Bradycellus ponojensis, sp. n., J. Sahlberg, Not. Fenn. xiv. p. 131, Russian Lapland.

Selenophorus propinquus, sp. n., J. Putzeys, Ann. Ent. Belg. xvii. p. 118, Antigua.

Pangus externepunctatus, p. 74, Kisil-kum Desert, *intermittens*, p. 75, *diversopunctatus* [!], p. 76, Maracand, spp. nn., Solsky, *l. c.*

Ophonus cycloderus, Varsaminor, *chlorizans*, Kokand, spp. nn., *id. l. c.* p. 78.

Harpalus anisodactyliformis, p. 80, *viridulus*, p. 82, Kokand, *remboides*, p. 84, Kara-kum Desert, *id. l. c.*; *H. bucculentus*, p. 299 (? = *servus*, Duft., local race), *cyanelus*, p. 300, Kraatz, B. E. Z. xviii. Sarepta; spp. nn.

Feroniides.

CHAUDOIR, Bull. Mosc. xlviii. pt. 1, pp. 1-34, in the conclusion of his 'Matériaux pour servir à l'étude des Féroniens,' founds several new genera and re-characterizes *Ceneus*, Chaud. (*C. chalybeipennis*, Chaud., = *Pterostichus coracinus*, Er.); *Marsyas*, Putz. (*M. angustatus*, Mots., re-named *viridieneus*, p. 7); *Euchroa*, Brullé, which with *Microcephalus* forms a group near the *Trigonotomides*, to be called *Euchroides*; *Myas*, Ziegl. (*M. foveatus*, Lec., = *cyanescens*, Dej.; (*M. rugosicollis*, Brullé, is distinct from *chalybeus*, and is [unnecessarily] re-named *brulléi*); and *Metazys*, Chaud.

Percus paykulli, figs. 3, 4, 6, 8 & 10, *P. passerinii*, figs. 5 & 7 (egg, fig. 9); larvæ described and figured. P. Bargagli, Bull. Ent. Ital. vi. pp. 27-30, pl. i.

Pterostichus nigritus, Scotch var.; T. Blackburn, Ent. M. M. x. p. 252.

Feronia (Argutor) chilensis, Dej., agrees with *Lagurus* except in its long scutellar striae; E. C. Reed, P. Z. S. 1874, p. 60.

Steropus. The species of the Iberian peninsula grouped; in Portugal only those with a single dorsal puncture in the elytral striae occur. J. Putzeys, Ann. Ent. Belg. xvii. pp. 54-56.

Delinius essingtonii [-nicus], Westw., briefly re-characterized and figured by the author, Thesaurus entomologicus oxoniensis, p. 1, pl. ii. fig. 1. Its general affinities are with the *Harpalides*, approaching *Promecognathus* and *Eripus*.

Megadromus viridilimbatus, Mots., = *Trichosternus antarcticus*, Chaud.;

Feronia vagepunctata, White, = *Holcaspis subcenea*, Guér. ; H. W. Bates, Ann. N. H. (4) xiii. pp. 242 & 243.

Zabrus gibbus. Particulars of damages by this insect near Bologna ; G. Bertoloni, Bull. Ent. Ital. vi. p. 327.

Amara grandicollis, Zimm., *rufocincta*, auctt., = *prætermissa*, Sahlb. (1827, ex. typ.), p. 108 ; a ? var. *puncticollis* of *A. interstitialis*, Dej., is described from Russian Karelia, p. 109 ; J. Sahlberg, Not. Fenn. xiv.

Hormochilus, g. n., Chaudoir, l. c. p. 1. Differs from *Ceneus*, Chaud., in its deeply emarginate labrum, slender antennæ and tarsi, and want of puncture on 3rd interstice. *Eccoptogenius feronoides*, Cast., = *Ceneus monochrous*, Chaud.

Hybothecus, g. n., id. l. c. p. 3. With very convex elytra. Differs from *Orthomus* in the smaller and shorter epilobes of the mentum. *H. incrasatus*, sp. n., id. l. c. p. 4, Columbia.

Pachythecus, g. n., id. l. c. p. 8. Near *Marsyas* and *Abar[eo]idius* ; facies of *Pæcilus cupreus*. *P. rubro-cupreus*, sp. n., id. l. c. p. 9, Brazil.

Oribazus, g. n., id. l. c. p. 10. Elytra with 5 striæ. Near *Marsyas*. *O. catenulatus*, p. 12, Columbia, *5-striatus*, p. 14, Colombia, Caracas, id. l. c. spp. nn.

Styracoderus, g. n., id. l. c. p. 26. Last joint of palpi securiform. Facies of *Evarthrus*. Type, *Pterostichus atramentarius*, Rosenh.

Aepsera, g. n., id. l. c. p. 28. Palpi slender and pointed ; no tooth in the emargination of the mentum. *A. ferruginea*, sp. n., id. l. c. p. 30, Burmah.

Cyrtomoscelis, g. n., id. l. c. p. 32. Outer edge of 4 posterior tibiæ 4-tuberculate. Facies of *Celia*. *C. natalensis*, sp. n., id. l. c. p. 33, Natal.

Euchroa dimidiata, p. 17, Oaxaca, *cupripennis*, p. 19, Hayti, *sallæi*, p. 20, Mexico, id. l. c. spp. nn.

Eucamptognathus diversus, sp. n., id. l. c. p. 22, Madagascar.

Pæcilus longiventris, p. 91, Maracand, Taschkent, *janthinipennis*, p. 93, *leptoderus*, *carbonicolor*, p. 94, Kokand, spp. nn., S. Solsky, Fedchenko's Turkestan, ii. 5.

Percus alienus, sp. n., E. C. Reed, P. Z. S. 1874, p. 60, pl. xiii. fig. 8, Valdivia.

Pterostichus rhilensis, A. v. Rottenberg, B. E. Z. xviii. p. 327, Rhilo Dag : *P. vanvolzemi*, Putzeys, Ann. Ent. Belg. xvii. p. 56, S. Portugal.

Argutor stricticollis, sp. n., Solsky, l. c. p. 97, Sarafschan Valley.

Feronia (*Argutor*) *wasastjernæ*, p. 99, Vasa, *F. middendorffi*, p. 102, Russian Lapland, J. Sahlberg, Not. Fenn. xiv., spp. nn.

Holcaspis ædicnema, p. 243, *maorinus*, p. 244, spp. nn., Bates, Ann. N. H. (4) xiii. New Zealand.

Zabrus theveti, sp. n., A. Chevrolat, Bull. Soc. Ent. Fr. (5) iv. p. lxxviii. Andalusia.

Celia picina, sp. n., Solsky, l. c. p. 102, Maracand.

Anchomenides.

Pristonychus acutangulus, Schauf., has nothing to do with *elongatus*, Dej. ; J. Emery, Nouv. ét. faits, No. 46, p. clxxxv.

Calathus kollari, Ptz. (*angustatus*, Redt., nec Ramb.), = *Amphigynus rotundicollis*, Dej. (*piceus*, Marsh., nec L., which is a *Platynus*); *C. advena*, Lec., is older than *lenis* or *dulcis*, Mann.; E. v. Harold, C. H. xii. p. 105.

Calathus mollis; dark var. from Shetland Isles. T. Blackburn, Ent. M. M. xi. p. 112.

Tropopterus is closely allied to *Colpodes*; E. C. Reed, P. Z. S. 1874, p. 58.

Calathus tarsalis, sp. n., J. Sahlberg, Not. Fenn. xiv. p. 114, Russian Lapland.

Platynus edwardsi, sp. n., H. W. Bates, Ann. N. H. (4) xiii. p. 239, New Zealand.

Anchomenus feredayi and *lawsoni*, H. W. Bates, l. c. p. 240, New Zealand; *A. archangelicus*, J. Sahlberg, l. c. p. 118, Russian Karelia: spp. nn.

Tropopterus sulcicollis, p. 241, *seriatoporus*, p. 242, spp. nn., H. W. Bates, l. c., New Zealand.

Pogonides.

Patrobis assimilis, Chaud., considered a var. of *excavatus* [but the characters given do not by any means exhaust the differences between the two insects], and the genus stated to be peculiarly liable to climatic influence. J. Sahlberg, Not. Fenn. xiv. pp. 90-92.

Pogonus fulvus, Baudi, = *grayi*, Woll., and occurs at the extreme south of Portugal; Putzeys, Ann. Ent. Belg. xvii. p. 53. It has nothing to do with *Cardiaderus chloroticus*, Fisch., and belongs to *Syrdenus*, Chaud.; F. Baudi, Nouv. et faits, No. 46, p. clxxxvii.

Pogonus parallelus, Texas, *depressus*, California, spp. nn., J. L. Leconte, Tr. Am. Ent. Soc. v. p. 44.

Trechides.

Trechus lapidosus, Daws., in the Shetland Isles; T. Blackburn, Ent. M. M. xi. p. 112. *T. politus*, Sol., nec Brullé, re-named *solieri*; E. C. Reed, Cat. Ins. Chil. p. 12.

Anophthalmus. Larvæ and pupæ found in Salt Cave, near Mammoth Cave, Kentucky. Larva very like that of *Pterostichus nigrinus*, as figured by Schiödte, but more slender, with longer head and shorter caudal appendages. End of the body like *Harpalus* and *Stenolophus* larva, mandibles like *Harpalus*; eyeless, body white and soft. A. S. Packard, Jr., Am. Nat. viii. p. 562.

Trechus modestus, p. 49, Piedmontese Alps, *nitens*, p. 50, Tasmania, J. Putzeys, S. E. Z. xxxv.; *T. diaphanus*, A. v. Rottenberg, B. E. Z. xviii. p. 328, Taygetus: spp. nn.

Anophthalmus carantii, sp. n., E. Sella, Bull. Ent. Ital. vi. p. 82⁴, pl. ii. fig. 1, Valley of Pesio.

Bembidiides.

Tachys focki, Humm. (Nov. 1822), = *bisulcatus*, Nicol. (Sept. 1822); J. Sahlberg, Not. Fenn. xiv. p. 89. Found in a cavern in Portugal, in bats' excreta; J. Putzeys, Ann. Ent. Belg. xvii. p. 59. *T. 'monochrous*,

Schaum, H. W. Bates, = *australis*, Schm.; E. v. Harold, C. H. xii. p. 115.

Bembidium dufouri, Perr. ("inéd. ?"), = *punctulatum*, var.; J. Putzeys, l. c. p. 60. *B. chilense*, Sol., ? = *spinolæ*, Sol., var.; *B. convexiusculum*, Sol., nec Mots., is re-named *varicolor*; *B. hydrophilum*, Germ., is a *Tachys*, *B. circuliforme*, Sol., is a *Pericompsus*; E. C. Reed, P. Z. S. 1874, p. 66. *B. maculatum*, Sol., re-named *maculiferum*; *B. incertum*, Sol., re-named *solieri*; id. Cat. Ins. Chil. p. 13. *B. biguttatum*, F., Gyll. Stm., ? Schiödt, Thoms., Seidl. (*riparium*, Ktz.), and *B. inoptatum*, Schaum, Seidl. (*biguttatum*, Ill., Dej., Redt., nec F.; *guttula*, Redt.): this synonymy given by G. Seidlitz, B. E. Z. xviii. pp. 131-133, in a discussion of the confusion attending the two species. Kraatz criticizes these observations, and considers the synonymy to be:—*B. biguttatum*, F., Duv., Seidl. (*riparium*, Payk., Ol., Ktz.; *guttula*, Redt., nec F.), and *B. vulneratum*, Dej. (*inoptatum*, Schaum, Seidl.; *biguttatum*, Redt.); tom. cit. pp. 133 & 134.

Typhlocharis sylvanoides, Dieck, does not belong to the *Cucujidæ*, but must be placed near *Anillus* [!]; E. Abeille, Bull. Soc. Ent. Fr. (5) iv. p. ccxxiii.

Tachypus flavicornis, sp. n., S. Solsky, Fedchenko's Turkestan, ii. 5, p. 112, Sarafschan Valley.

Tachys picturatus, J. Putzeys, l. c. p. 119, Antigua; *T. antarcticus*, H. W. Bates, Ann. N. H. (4) xiii. p. 274, New Zealand; *T. tetraspila*, Solsky, l. c. p. 114, Maracand: spp. nn.

Bembidium luridicorne, p. 117, *cupreolum*, p. 118, *platypterum*, p. 120, *cardiaderum*, p. 123, Maracand, *kokandicum*, p. 120, *abbreviatum*, p. 129, *marginipenne*, p. 130, Taschkent, *piceocyaneum*, p. 124, *ovalipenne*, p. 125, *dilutipenne*, p. 128, Kokand, *insidiosum*, p. 130, Sarafschan Valley, Solsky, l. c.; *B. repandum*, p. 78, Russian Lapland (? = *anglicanum*, Shp.), *contaminatum*, p. 83, Finland, J. Sahlberg, Not. Fenn. xiv.; *B. chlorostictum*, E. C. Reed, P. Z. S. 1874, p. 66, Chiloe; *B. rotundicolle*, H. W. Bates, Ann. N. H. (4) xiii. p. 275, New Zealand: spp. nn.

Microtyphlus perpusillus, sp. n., A. v. Rottenberg, B. E. Z. xviii. p. 329, Saloniki (the smallest known Carabid).

DYTISCIDÆ.

Dysmathes sahlbergi, Mann., = *Amphizoa insolens*, Lec., ex. typ.; A. Sallé, Bull. Soc. Ent. Fr. (5) iv. p. ccxxii.

Cnemidotus cæsus; larva described and figured by Schiödt, Nat. Tids. (3) viii. pp. 203-207, pl. viii. figs. 1-13.

Pelobius hermanni. Larva, pp. 198-203, pls. v. figs. 1-8, vi. figs. 1 & 2, vii. figs. 1-5; pupa, p. 203, pl. v. figs. 9 & 10. Described and figured by Schiödt, l. c. The cerci are very long and natatorial.

Hydroporus griseo-striatus, *tristis*, and *angustatus*; varr. from the Shetland Isles. T. Blackburn, Ent. M. M. xi. p. 112.

Laccophilus minutus. Larva described and figured by Schiödt, l. c. pp. 208-210, pl. vii. figs. 6-11.

Agabus guttatus, Shetland, and *A. maculatus*, Braemar; varr. recorded by T. Blackburn, l. c. *A. dilatatus*, Sol., re-named *solieri*; E. C. Reed, Cat. Ins. Chil. p. 15 [there is already an *Agabus solieri*, Aubé, 1836].

Eunectes sticticus and *Dytiscus marginalis* from Japan; D. Sharp, Tr. E. Soc. 1874, p. 417.

Hybrid between *Dytiscus latissimus* and *dimidiatus* described and figured, with observations on other known cases of hybridism in Coleoptera; G. Kraatz, B. E. Z. xviii. pp. 293-296, pl. i. figs. 1-4.

Dytiscus ibericus, Ros., ? = *pisanus*, Cast., var.; *id. l. c.* p. 296.

Graphoderes piciventris, Thoms., = *zonatus*, Pz., var.; J. Sahlberg, Not. Fenn. xiv. p. 161.

Arctodytes, g. n., C. G. Thomson, Opusc. Ent. (fasc. vi.) p. 541, for *Dytiscus elongatus*, Gyl.

Homœolytrus [*Homœolytratus*], sub-g. n. of *Acilius*, from which it differs in the cupules of the anterior tarsi of the ♂ differing slightly in size, and in the elytra of the ♀ not being sulcate, thus agreeing with sub-g. *Thermonectus*, containing exotic species only, and from which the author apparently separates it solely on that account. *Acilius duvergeri*, sp. n., Dax, Landes. E. Gobert, Ann. Soc. Ent. Fr. (5) iv. p. 441, Bull. p. cxx.

Brychius cristatus, sp. n. (J. Sahlberg, MS.), F. Morawitz, Bull. Ent. Ross. x. p. xiii. Lapland; J. Sahlberg, Not. Fenn. xiv. p. 137 ("December, 1874," p. 200).

Hydroporus fractilinea, S. Solsky, Fedchenko's Turkestan, ii. 5, p. 134, Maracand; *H. rufipes* and *pivicornis* (J. Sahlberg, MS.), Morawitz, l. c. Lapland; *H. kolstremi*, p. 145, Lapland, *obtusipennis*, p. 146, Russian Lapland, *rubripes*, p. 151, *pivicornis*, p. 152, Lapland [evidently the same as *H. rufipes* and *pivicornis* above mentioned], *monilicornis*, p. 154, Russian Lapland (? = *brevis*, Thoms., nec Sahlb.), J. Sahlberg, l. c.; *H. submuticus*, C. G. Thomson, Opusc. Ent. (vi.) p. 537, Helsingland; *H. (Cœlambus) unguicularis*, p. 73, British Columbia, *masculinus*, p. 74, Lake Labache, G. R. Crotch, Tr. Am. Ent. Soc. v.: spp. nn.

Laccophilus stœhmi, sp. n., C. G. Thomson, l. c. p. 535, Helsingland.

Gaurodytes mimmi (J. Sahlberg, MS.), Morawitz, l. c. p. xiv. Lapland; *G. coriaceus*, p. 174, Lapland, *obovatus*, p. 176 (? = *Colymbetes subquadratus*, Mots.), *obscuripennis*, p. 177, Russian Lapland, *ovalis*, p. 178, Gottlund, *7-seriatus*, p. 180, Abo, *mimmi*, p. 182, North Finland [see *suprà*], J. Sahlberg, l. c.: spp. nn.

Agabus amœnus, sp. n., S. Solsky, Fedchenko's Turkestan, ii. 5, p. 142, Urgut.

GYRINIDÆ.

Gyrinus strigosus. Larva described and figured by Schiödte, Nat. Tids. (3) viii. p. 211, pl. vi. figs. 3 & 4.

HYDROPHILIDÆ.

Helophorus, *Berosus*, *Hydrophilus*, *Hydrous*, *Hydrobius*, *Philhydrus*, *Cercyon*, and *Sphæridium*. Larvæ tabulated; Schiödte, Nat. Tids. (3) viii. pp. 211-216. *Berosus signaticollis*, larva briefly described, p. 216; *Spercheus emarginatus*, larva fully described and figured, pp. 217-221, pl. ix. figs. 1-12.

Laccobius. 11 European species recognized. Varieties of *L. nigriceps*, Thoms., described and named *minor*, *maculiceps*, *albescens*, *obscuratus*, *neapolitanus*, *atratus*, and *rufescens*; *L. subtilis* and *intermittens*, Kies., = *viridiceps*, Rott., of which *sardeus*, Baudi, is a var.; var. n. *nanulus* of *L. minutus*, L., described from Hanover; var. n. *græcus* of *L. alutaceus*, Thoms., from Nauplia; varr. nn. *gracilis*, Palermo, *nigritus*, Corsica, of *L. alternus*, Mots.; var. n. *debilis*, of *L. pallidus*, Muls., from Aveiro. A. von Rottenberg, B. E. Z. xviii. pp. 305-324.

Helophorus tuberculatus, Gyll., in England; E. C. Rye, Ent. M. M. xi. p. 135.

Cercyon quisquilius and *Cryptopleurum atomarium* from Japan; D. Sharp, Tr. E. Soc. 1874, pp. 417 & 420.

Sepidulum, g. n., J. L. Leconte, Tr. Am. Ent. Soc. v. p. 47. Prothorax as in *Sepidium* (*Tenebrionidæ*); "characters altogether anomalous, but seeming to resemble those of *Hydrophilidæ* rather than any other family, approaching more nearly perhaps to *Ochthebius*." *S. costatum*, sp. n., id. l. c. p. 48, Texas.

Hydrobius chalcæolus, sp. n., S. Solsky, Fedchenko's Turkestan, ii. 5, p. 149, Maracad.

Laccobius emmeryanus, A. von Rottenberg, l. c. p. 318, S. Italy, Sicily, Andalusia; *L. sellæ*, D. Sharp, Bull. Ent. Ital. vi. p. 317, Piedmont: spp. nn.

Cercyon ustus, *olibrus*, and *sorex*, spp. nn., D. Sharp, Tr. E. Soc. 1874, p. 418, Japan.

Cyclonotum simplex, China and Japan, *breve*, Japan, spp. nn., id. l. c. p. 419.

HYDROSCAPHIDÆ.

J. L. Leconte, Tr. Am. Ent. Soc. v. pp. 45 & 46, proposes the above family for the reception of a new genus, *Hydroscapha*, differing from *Limnobius*, and all other *Hydrophilidæ*, in its laminate and widely separated hind coxæ and peculiar abdomen, and connecting the *Hydrophilidæ*, *Scaphidiidæ*, and (?) *Trichopterygidæ*. Type, *H. natans*, sp. n., id. l. c. p. 46, Los Angeles, California.

D. Sharp, Ent. M. M. xi. pp. 101-104, reprints this paper, confirming Leconte's characters, except that the antennæ are 8-jointed, and the tarsi only 3-jointed, and that the affinity to the *Trichopterygidæ* is stronger than Leconte imagined. The genus occurs in Europe, a new species, *H. crotchii*, from Madrid, being described (p. 103), and the suggestion is made that *Limnobius evanescens*, Kies., and *L. gyronoides*, Aubé, are possibly members of it.

PAUSSIDÆ.

Paussus procerus. The vapour given off by this species does not hurt the skin, but the yellow crust left after the first explosion produces on the tongue the effect of a burn. Raffray, Pet. Nouv. vi. p. 376.

Paussus cornutus recorded from the Sahara; L. Fairmaire, tom. cit. p. 407.

J. O. WESTWOOD, *Thesaurus ent. oxon.*, p. 72 *et seq.*, summarizes records of the economy of members of this family, and gives a supplement to his treatise in *Arcana ent.* ii. (1843-45). He briefly redescribes (amongst others) and figures the following species, described by himself (unless where noted):—*Cerapterus* (*Orthopterus*) *lafertei*, pl. xv. fig. 11, *C. (Pleuropterus) alternans*, pl. xvi. fig. 2, and *hastatus*, fig. 3, p. 74; *C. (Arthropterus) wilsoni*, pl. xv. fig. 7, p. 75, *denudatus*, fig. 1, *brevis*, fig. 2, p. 76, *parallellocerus*, fig. 9, p. 77, *kirbii*, pl. xvi. fig. 1, p. 79; *Melanopsilus* (*Merismoderus*) *bensoni*, pl. xviii. fig. 1, p. 80; *Hylotorus bucephalus*, Gyll., pl. xviii. fig. 2, p. 81; *Platyrrhopalus mellii*, pl. xviii. figs. 2 & 3, p. 82; *Paussus humboldti*, pl. xix. fig. 11, *procerus*, Gerst., fig. 7, p. 83; *verticalis*, Rehe., fig. 8, *spinicoxis*, pl. xviii. fig. 7, p. 84; *curtisi*, fig. 11, *sinicus*, fig. 10, p. 85; *cultratus*, pl. xix. fig. 1, *granulatus*, fig. 3, *chevolati*, pl. xvii. fig. 5, p. 86; *nauceras*, Benson, pl. xvi. fig. 8, *politus*, fig. 10, *pleophorus*, Bens., fig. 11, p. 87; *denticulatus*, fig. 12, *pacificus*, fig. 7, *jerdani*, pl. xviii. fig. 4, p. 88; *bowringi*, pl. xvi. fig. 9, *turcicus*, Friv., pl. xviii. fig. 5, *hystrix*, pl. xvi. fig. 5, p. 89; *spencii*, pl. xviii. fig. 8, *afzeli* (*lætus*, Gerst.), pl. xvii. fig. 6, p. 90; *parrianus*, pl. xvii. fig. 7, *audoini*, fig. 8, p. 91; *burchellanus*, fig. 10, *murrayi*, fig. 11, *dohrni*, fig. 12, p. 92; *cucullatus*, pl. xviii. fig. 6, *bohemanni*, fig. 9, *degeeri*, fig. 12, p. 93; *germari*, pl. xix. fig. 2, *schaumi*, fig. 6, p. 94; *inermis*, Gerst., fig. 5, *setosus*, fig. 4, p. 95.

The following new species are described:—

Cerapterus (*Orthopterus*) *stali*, p. 73, pl. xv. fig. 10, Africa.

Arthropterus punctatissimus, pl. xv. fig. 3, *quadricollis*, fig. 8, p. 75, *subcylindricus*, p. 76, fig. 2, *howitti*, fig. 4, *melbournii* [*nianus*], fig. 5, p. 77, Australia.

Lebioderus percheroni, p. 80, pl. xvii. fig. 3, Tinga.

Hylotorus hottentottus, p. 81, pl. xvii. fig. 1, S. Africa.

Platyrrhopalus vexillifer, p. 82, pl. xvii. fig. 4, Penang, *castelnaudi*, p. 96, Siam.

Paussus niloticus, p. 83, pl. xix. fig. 9, White Nile, *damarinus*, p. 84, pl. xvii. fig. 9, S. Africa, *schiodtii*, p. 85, pl. xvi. fig. 6, Bengal, *waterhousii*, p. 90, pl. xvi. fig. 4, *vollenhovii* [*hoveni*], p. 94, pl. xix. fig. 10, tropical Africa.

STAPHYLINIDÆ.

D. SHARP, Tr. E. Soc. 1874, pp. 1-103, describes 190 species from Japan, mostly brought from that country by Mr. G. Lewis (30 others are not yet described). Only one of the three or four known Japanese species is included in this number, and nearly all of a dozen species received by the author from other sources from Japan are specifically distinct from any found by Mr. Lewis. New genera and many new species are described. Cf. also Kraatz, B. E. Z. xviii. p. 289.

The 5th livraison of vol. iii. of A. FAUVEL'S "*Faune Gallo-Rhénane*" [Zool. Rec. x. p. 250] has been published, dated September, 1874, and containing pp. 391-544, Supplement ii. (dated July, 1874) pp. 25-46, and pls. iii. & iv. Of this portion, pp. 393-544 form pp. 167-318, the supplement forms pp. 319-340, and the pls. are pls. i. & ii., of Bull. Soc.

L. Norm. (2) viii. for 1873-74, dated 1874, and simultaneously received in London in March 1875. It contains from *Xantholinus* to *Tanygnathus* (inverted classification), and the supplement, as before, covers all the parts hitherto published. Many very old names are resuscitated, and much synonymy given. References are made to pls. v. & vi. not accompanying the part now published.

The same author, Ann. Ent. 1874, pp. 70-80, reviews Mulsant & Rey's "Brévipennes" [Zool. Rec. x. p. 250], pointing out the great probability of most of those authors' new species being already described. According to him, *Homalota gibbera* = *occulta*, Er., *H. ebenina* = *contristata*, Ktz., *Gyrophæna punctulata* = *puncticollis*, Th., *G. despecta* = *bihamata*, Th., *Phytosus seminularis* = *dimidiatus*, Woll., and the genus *Kraatzia* = *Notothecta*, Th. The unnecessary creation of new genera is justly criticized.

New Caledonia. 9 species (including 2 new genera) described; id. Ann. Soc. Ent. Fr. (5) iv. pp. 432-438, pl. x. No. ii.

J. C. Schiödt, Nat. Tids. (3) viii. fully describes and figures the larvæ of the following species:—*Stenus bipunctatus*, pp. 548-552, pl. xviii. figs. 1-9; *Tachinus rufipes*, pp. 553-557, pl. xix. figs. 1-9; *Tachyporus chrysomelinus*, pp. 557-559, pl. xix. figs. 10-15; *Syntomium æneum*, pp. 559-563, pl. xx. figs. 1-12.

Aleocharides.

Aleochara puberula, Kl., *Myrmedonia cognata*, Mkl., var. ?, and *Homalota melanaria*, Sahlb., recorded from Japan; D. Sharp, Tr. E. Soc. 1874, p. 9 et seq.

Santhota, g. n., id. l. c. p. 3. Between *Falagria* and *Bolitochara*, differing from the former in the mesosternum, and from the latter in its broadly separated middle coxæ; differs from *Astilbus* in the short articulating collar of the mesosternum. *S. sparsa*, sp. n., id. l. c. p. 4, Japan.

Falagria simplex, *sapida*, p. 2, *fovea*, p. 3, id. l. c. Japan: spp. nn.

Ocalea japonica, sp. n., id. l. c. p. 4, Japan.

Leptusa picipennis, S. Solsky, Fedchenko's Turkestan, ii. 5, p. 159, Maracand, Taschkent; *L. alpicola*, p. 227, *flavicornis*, p. 228, K. Brancsik, B. E. Z. xviii. Hungary: spp. nn.

Thiasophila rufescens, sp. n., Sharp, l. c. p. 5, Japan.

Homæusa japonica, sp. n., id. *ibid.*, Japan.

Microglotta princeps, sp. n., id. l. c. p. 6, Japan.

Aleochara parens, p. 6, *discoidea*, *claviger*, p. 7, *japonica*, p. 8, *præsul* (also from Lake Baikal), *peregrina*, *fucicola*, p. 9, id. l. c. Japan; *A. sareptana*, Solsky, l. c. p. 161, Sarafschan Valley: spp. nn.

Myrmedonia comes and *socius*, Sharp, l. c. p. 10, Japan; *M. triangulum*, L. Perez Arcas, An. Soc. Esp. iii. p. 111, pl. i. fig. 1, Escorial: spp. nn.

Ilyobates pictus, sp. n., Sharp, l. c. p. 11, Japan.

Tachyusa rufescens, p. 11, *algarum*, p. 12, id. l. c. Japan, spp. nn.

Oxyptoda japonica, p. 12, *proba*, p. 13, id. l. c. Japan; *O. sahlbergi*, Seidlitz, Fauna Baltica, p. 323, Finland: spp. nn.

Homalota transfuga, p. 13, *lewisi*[an]*a*, *distans*, p. 14, *vivida*, p. 15, Sharp, l. c., Japan, spp. nn.

Dinopsis modestus, sp. n., *id.* l. c. p. 16, Japan.

Tachyporides.

Cilea silphoides, L., *Coproporus* sp., and *Conurus pedicularius*, Gr. ?, recorded from Japan; D. Sharp, l. c. pp. 17 & 18.

Erchomus colchicus, Ktz., occurs in Spain; Pandellé's union of the genus with *Cilea* is criticized: Kraatz, B. E. Z. xviii. pp. 297 & 298.

Tachinus manueli, D. Sharp, Bull. Ent. Ital. vi. p. 318, Pesio, Piedmont, Alps; *T. mimulus*, *id.* Tr. E. Soc. 1874, p. 16, Japan: spp. nn.

Tachyporus celatus, sp. n., *id.* Tr. E. Soc. 1874, p. 17, Japan.

Conurus germanus, p. 17, *pumilus*, p. 18, spp. nn., *id.* l. c. Japan.

Megacronus setiger, p. 18, *princeps*, p. 19, spp. nn., *id.* l. c. Japan.

Bryoporus lewisi[an]*us*, sp. n., *id.* l. c. p. 19, Japan.

Bolitobius japonicus, sp. n., *id.* l. c. p. 20, Japan.

Quediides.

Velleius dilatatus, F., and *Quedius lateralis*, Gr., from Japan; D. Sharp, l. c. pp. 23 & 25.

Quedius microps, Grav., is to stand for *chrysurus*, Kies. (following Thomson), and "there is no need to pay attention to the controversial opinions of English authors," reference being especially made to a note by the Recorder in Ent. Ann. 1870, p. 81 [This note is simply an account of the various ways in which continental writers have tried to account for *Q. microps* (all referring it to the *Raphirus* group); and the only opinion given in it is M. Fauvel's own, which also erroneously refers the insect to that group!]; *Quedius 4-punctatus*, Thoms., = *ochripennis*, Mén., and *Q. fulgidus* is not included in Thomson's species; *Q. atolicus*, Ktz., = *cruentus*, Ol.; Fauvel, Faune Gallo-Rhénane, iii. p. 500, *et seq.*

Rientis, g. n., D. Sharp, l. c. p. 21. Near *Astrapæus*. *R. parviceps*, sp. n., *id.* *ibid.*, Japan.

Algon, g. n., *id.* l. c. p. 22. Intermediate in facies between *Quedius* and *Ocypus*, and in natural position between *Quedius* and *Astrapæus*. *A. grandicollis*, sp. n., *id.* l. c. p. 23, Japan.

Heterothops cognatus, sp. n., *id.* l. c. p. 20, Japan.

Velleius pectinatus, sp. n., *id.* l. c. p. 24, Japan.

Quedius juno, p. 24, *simulans*, *parviceps*, p. 25, *japonicus*, *pretiosus*, p. 26, *lewisi*[an]*us*, p. 27, spp. nn., *id.* l. c. Japan.

Staphylinides.

Creophilus maxillosus (varr. nn. *subfasciatus*, *medialis*, and *imbecillus*, p. 28), *Philonthus agilis*, Gr., *scybalarius*, Nordm., *quisquiliarius*, Gyll. (and var. *rubidus*, Er.), and *thermarum*, Aubé, recorded from Japan; *Creophilus maxillosus*, *cinerarius*, *arcticus*, and *villosus* are probably only races of one species. D. Sharp, l. c. p. 27 *et seq.*

Staphylinus armeniacus, Sharp, = *meridionalis*, Rosen.; *Ocypus cerdo*, Er., = *compressus*, Msh., var.; *Cafius*, Steph., is maintained as a genus; *C. pruinosis*, Er., *filum*, Kies., *ægyptiacus*, Mots., = *sericeus*, Holme;

Philonthus orbus, Kies., and *xantholinoides*, Woll., ? = *prolixus*, Er., varr.; *P. succicola*, Thoms., *carbonarius*, Er., nec Gyl., = *proximus*, Kraatz [from North India !], ex. typ.; *P. scutatus*, Er., = *rotundicollis*, Mén.; *P. nigrutilus* and *thermarum* are cosmopolitan, and many species supposed to be distinct are merged in them; *P. latus*, Er., nec Heer, is re-named *hilaris* (p. 472); A. Fauvel, Faune Gallo-Rhénane, iii. p. 404 et seq.

Phucobius [*Phyc*], g. n., D. Sharp, l. c. p. 35. Combines the characters of *Ocypus* and *Philonthus*. Ligula divided and emarginate (it is entire, teste Fauvel, Faune Gallo-Rhénane, iii. p. 421, note), palpi slender, neck smooth. *P. simulator*, sp. n., id. ibid., Japan, and ? *Quedius pectoralis*, Boh.

Diplostictus, g. n., A. Fauvel, Ann. Soc. Ent. Fr. (5) iv. p. 437. Approaches *Cafius* in the long first joint of its tarsi, which are widened and flattened; maxillary palpi with 4th joint aciculate. Type, *Staphylinus chenui*, Perroud.

Hesperus, g. n., Fauvel, Faune Gallo-Rhénane, iii. p. 426. Closely allied to *Philonthus*; thoracic lateral seta far from margin, lateral fold wide and short, metasternum strongly projecting in a triangle in front. *P. rufipennis* and *baltimorensis*, Grav., and *hæmaturus*, Er. (= *apicalis*, Say).

Erichsonius [-nia, Westwood, Coleoptera, 1849], g. n., id. l. c. p. 427. Differs from *Belonuchus* in its non-spinose femora, and from *Philonthus* in its palpi and tarsi, and the insertion of its thoracic lateral seta. *Philonthus cinerascens*, Gr., and 18 allied species.

Leistotrophus gracilis, p. 28, *oculatus*, p. 29, spp. nn., D. Sharp, l. c. Japan.

Euclidelus japonicus, sp. n., id. l. c. p. 29, Japan.

Staphylinus paganus, p. 30, *inornatus*, *subaneus*, p. 31, spp. nn., id. l. c. Japan.

Gærius carinatus, sp. n., id. l. c., p. 32, Japan.

Ocypus lewisi [an]us, *parvulus*, p. 33, *gloriosus*, p. 34, spp. nn., id. l. c. Japan.

Philonthus plagiatus, p. 448, note, Algeria, *nimbicola*, p. 457, Monte Rosa, *anguinus*, p. 464, Pyrenees, *pisciformis*, p. 468, Var, *laticollis*, p. 488, Tarbes, Spain, Fauvel, l. c.; *P. (Cafius, Thoms.) nudus*, p. 36, *vestitus*, *histrion*, p. 37, *mimulus* and *algarum*, *P. quedioides*, p. 38, *spinipes*, p. 39, *japonicus*, *parvus*, p. 40, *macies*, *germanus*, p. 41, *rectangulus*, *lewisi* [an]us, p. 42, *solidus*, *mutans*, p. 43, *egens*, p. 44, *sericans*, *amicus*, p. 45, *prolatus*, *kobensis*, p. 46, *rutiliventris*, p. 47, *gastral*, p. 48, *tiro*, *pumilus*, p. 49, Japan, D. Sharp, l. c.; *P. rubellus*, S. Solsky, Fedchenko's Turkestan, ii. 5, p. 179, Maracand: spp. nn.

Xantholinides.

Typhlodes italicus, Shp., ex. typ., = *Xantholinus tenuipes*, Baudi, which has small but distinctly visible eyes; F. Baudi, Nouv. et faits, No. 46, p. clxxxvii.; C. A. Dohrn, S. E. Z. xxxv. p. 85.

Xantholinus longiventris, Heer, *multipunctatus*, Thoms., = *linearis*, Ol. [!]; A. Fauvel, Faune Gallo-Rhénane, iii. p. 392.

Leptacinus flavipennis, Kr., from Japan; D. Sharp, Tr. E. Soc. 1874, p. 54.

Othius rufipennis, p. 49, *medius*, p. 50, *latus*, p. 51, D. Sharp, l. c. Japan; *O. pallidus*, K. Brancsik, B. E. Z. xviii. p. 134, Steiermark: spp. nn.

Xantholinus japonicus, *suffusus*, p. 52, *mixtus*, *pleuralis*, p. 53, Japan, D. Sharp, l. c.; *X. barbarus*, A. Fauvel, l. c. p. 389, note, Algiers: spp. nn.

Xanthophyus (?) *angustus*, sp. n., D. Sharp, l. c. p. 54, Japan.

Metoponcus variegatus, sp. n., A. Fauvel, Ann. Soc. Ent. Fr. (5) iv. p. 435, New Caledonia.

Pæderides.

Lathrobium luteipes, Fauv., = *punctatum*, Fourcr.; A. Fauvel, Faune Gallo-Rhénane, Suppl. (ii.) p. 42.

Stilicus ceylanensis, Kr., *Lithocharis spectabilis* and *staphylinoides*, Kr., and *L. debilicornis*, Woll., recorded from Japan; D. Sharp, Tr. E. Soc. 1874, p. 61 et seq.

Mesunius, g. n., D. Sharp, l. c. p. 68. Near *Sunius*: labrum 4-dentate in the middle, last joint of maxillary palpi invisible, 4th joint of tarsi bilobed. *M. wollastoni*, sp. n., *id. ibid.*, Japan, and ? *Sunius pulcher*, Aubé.

Neognathus, g. n., *id. l. c.* p. 69. Distinguished from *Sunius* by the shape of its head and thorax; neck very slender, thorax angulated in the middle, antennæ straight, very slender, 1st joint of posterior tarsi elongate, 4th bilobed. *N. angulatus*, sp. n., *id. l. c.* p. 70, Japan, N. China, and *Sunius pulchellus*, Kr.

Noumea, g. n., A. Fauvel, Ann. Soc. Ent. Fr. (5) iv. p. 433. Eyes placed on the disc. Placed before *Ophites*, from which it differs in the form of the palpi, scutellum, and elytra. *N. serpens*, sp. n., *id. l. c.* p. 434, pl. x. No. ii. New Caledonia.

Lathrobium digne[-num], *nudum*, p. 55, *partitum*, p. 56, *anguinum*, *kobense*, p. 57, *scabripenne*, *stilicoides*, p. 58, *crassicorne*, p. 59, spp. nn., D. Sharp, l. c., Japan.

Cryptobium apicatum, p. 59, *pectorale*, *japonicum*, p. 60, spp. nn., *id. l. c.*, Japan.

Stilicus rufescens, *id. l. c.* p. 61, Japan; *S. prolongatus*, S. Solsky, Fedchenko's Turkestan, ii. 5, p. 187, Taschkent: spp. nn.

Scopæus complex, p. 61, *virilis*, p. 62, *lithochar[it]oides*, and *S.* (?) *Thinocharis*) *basicornis*, p. 63, spp. nn., *id. l. c.*, Japan.

Lithocharis lewis[an]a, *prolixa*, p. 65, *parviceps*, *dissimilis*, p. 66, *id. l. c.* Japan; *L. procera*, L. Perez Arcas, An. Soc. Esp. iii. p. 112, pl. i. fig. 2, Madrid: spp. nn.

Acanthoglossa (?) *setigera*, sp. n., Sharp, l. c. p. 67, Japan.

Sunius latifrons, p. 70, *histrion*, *brevipes*, p. 71, *oculatus*, *bicolor*, p. 72, *suffusus*, p. 73, *chloroticus*, p. 74, *id. l. c.*, Japan; *S. lithochar[it]oides*, Solsky, l. c. p. 189, Maracand: spp. nn.

Pæderus poweri, p. 74, Japan, *mixtus* and *idæ*, p. 75, Japan and China, spp. nn., Sharp, l. c.

Pinophilides.

Edichirus lewisi[an]us, and *idæ*, spp. nn., D. Sharp, *l. c.* p. 76, Japan.
Pinophilus insignis and *lewisi*[an]us, p. 77, Japan, *rufipennis*, p. 78, Japan and China, *id. l. c.* spp. nn.

Stenides.

Stenæsthetus, g. n., D. Sharp, *l. c.* p. 79. Front and middle tarsi 5-jointed, posterior 4-jointed; intermediate in appearance between *Evæsthetus* and *Stenus*. *Stenæsth. sunioides*, sp. n., *id. l. c.* p. 80, Japan, N. China.

Leptotyphlus, g. n., A. Fauvel, Faune Gallo-Rhénane, Suppl. (ii.) p. 36, note. Forms at least a section, *Leptotyphli*, between the *Evæstheti* and *Steni* in the author's arrangement. Antennæ with 3-jointed club, very robust, short; labial palpi 2-jointed (wrongly 3-jointed in table), last joint of maxillary palpi elongate; eyes microscopic. *L. sublevis*, sp. n., *id. ibid.*, Corsica.

Evæsthetus nitidulus, sp. n., D. Sharp, *l. c.* p. 78, Japan.

Dianous nitidulus, sp. n., J. L. Leconte, P. Bost. Soc. xvi. p. 272, Oregon.

Stenus sparsus, Fauvel, *l. c.* p. 39, note, Corsica; *S. tenuipes* (also in China), p. 80, *alienus*, *verecundus*, p. 81, *lewisi*[an]us, p. 82, *macies*, *puberulus*, p. 83, *japonicus*, *sexualis*, p. 84, *rugipennis*, *cicindela* (also in China), p. 85, *hirtellus*, p. 86, *oblitus*, *dissimilis*, p. 87, *rufescens*, *curraaz*, p. 88, Japan, D. Sharp, *l. c.*; *S. micros*, p. 196, Maracand, *tumidulus*, p. 199, Taschkent, S. Solsky, Fedchenko's Turkestan, ii. 5: spp. nn.

Oxytelides.

Oxyporus angularis, Gebl., and *Oxytelus nigriceps*, Kr., from Japan; D. Sharp, Tr. E. Soc. 1874, pp. 89 & 93.

Bledius fuscipes, Rye, = *subterraneus*, Er.; G. Seidlitz, Fauna Baltica, p. 250 [an utterly erroneous collocation].

Thinobius ligeris, Pyot, described as new and figured; V. Pyot, Ann. Soc. Ent. Fr. (5) iv. pp. 79 & 80, pl. ii. fig. 1 [= *T. minutissimus*, Fauvel; Zool. Rec. x. p. 256].

Zalobius, g. n., J. L. Leconte, Tr. Am. Ent. Soc. v. p. 49. "Belongs to the group *Coprophili*"; no comparative diagnostic characters given. *Z. spinicollis*, sp. n., *id. ibid.*, Vancouver Island.

Osorius angustulus, sp. n., D. Sharp, *l. c.* p. 89, Japan.

Bledius fragilis and *lucidus* (also from China), p. 90, *orphanus*, p. 91, spp. nn., *id. l. c.*, Japan.

Platystethus operosus, sp. n., *id. l. c.* p. 91, Japan.

Oxytelus crassicornis, *lævior*, p. 92, *opacifrons*, p. 93, *cognatus*, *vicinus*, *minulus*, p. 94, *lewisi*[an]us, *laticornis*, p. 95, spp. nn., *id. l. c.*, Japan.

Ancyrophorus sericinus, sp. n., S. Solsky, Fedchenko's Turkestan, ii. 5, p. 206, Kokand.

Trigonurus crotchii, Vancouver Island and California, *cælatus*, California, spp. nn., Leconte, *l. c.* p. 48.

Homaliides.

Lathrimæum atricephalum, Gyl., from Japan; D. Sharp, *l. c.* p. 98.

Boreaphilus lewisianus and *japonicus*, spp. nn., *id. l. c.*, Japan.

Lesteva fenestrata, sp. n., *id. l. c.* p. 97, Japan.

Olophrum simplex, sp. n., *id. ibid.*, Japan.

Lathrimæum fratellum [-lus], sp. n., A. v. Rottenberg, B. E. Z. xviii. p. 330, Taygetus.

Homalium japonicum, D. Sharp, *l. c.* p. 98, Japan; *H. apicicorne*, p. 207, *turanicum*, p. 209, Maracand, *taschkentense*, p. 208, River Keless, S. Solsky Fedchenko's Turkestan, ii. 5 : spp. nn.

Anthobium solitare, Sharp, *l. c.* p. 98, Japan; *A. fulvipenne*, Solsky, *l. c.* p. 210, Kokand : spp. nn.

Microedus austinianus, sp. n., Leconte, *l. c.* p. 273, White Mountains and Vancouver Island.

Protinides.

Megarthus japonicus, *parallelus*, p. 99, *convexus*, p. 100, spp. nn., D. Sharp, *l. c.*, Japan.

Protinus egregius, L. Redtenbacher, Fauna Austriaca, Col., edn. 3, p. 550, Austria; *P. crassicornis*, Sharp, *l. c.* p. 100, Japan; *P. longicollis*, P. V. Gredler, C. H. xii. p. 52, S. Tyrol : spp. nn.

Phlæocharides.

Pseudopsis sulcata, Newm., in Algiers and France; Gandolphe, Bull. Soc. Ent. Fr. (5) iv. pp. cxlix. & cxi. The supposed representatives of this species in Canada and Venezuela are *P. columbica*, Fauv.; *tom. cit.* p. clxi.

Phlæocharis (*Scotodytes*) *laticollis*, sp. n., A. Fauvel, Faune Gallo-Rhénane, suppl. (ii.) p. 25, Piedmont.

Piestides.

Trygæus, g. n., D. Sharp, *l. c.* p. 421. Near *Trigonurus* (the labrum is furnished with distinct lateral appendages in that genus). *Tryg. princeps*, sp. n., *id. l. c.* p. 421, Japan.

Lispinus longulus, sp. n., *id. l. c.* p. 101, Japan.

Micropeplides.

Micropeplus fulvus, Er., var. n. *japonicus*; *id. ibid.* Japan.

Kalissus, g. n., J. L. Leconte, Tr. Am. Ent. Soc. v. p. 50. Head, thorax, and abdomen with no elevated lines; costæ of elytra represented by two pairs of impressed lines. *K. nitidus*, sp. n., *id. l. c.* p. 51, Vancouver Island.

PSELAPHIDÆ.

Twenty-four species (including 3 new genera) characterized from Japan, all (with a few others not in sufficiently good state to describe from) taken without special search by Mr. G. Lewis. The occurrence of a *Tmesiphorus*, and the comparative predominance of *Batrissi*, lead the author to consider the Japanese *Pselaphidæ* as presenting a greater resemblance to those of N. America than of Europe; nothing, however, is known of the species occurring in N.E. Asia. D. SHARP, Tr. E. Soc. 1874, pp. 106-125.

26 species from Australia, and 15 from New Zealand described. The latter are the first known from that country, and are comprised in 6 genera (2 new, 4 European), but probably other genera will have eventually to be characterized for some of them. A form is described connecting the *Pselaphini* and *Euplectini*. *Id. l. c.* pp. 483-515.

J. O. Westwood, *Thesaurus ent. oxon.*, shortly re-describes and figures his *Articerus amazonicus*, p. 96, pl. iv. fig. 1, and *A. tumidus*, p. 97, fig. 2; and also the following species [*Zool. Rec. vii. p. 269*]:—*Sathytes punctiger*, p. 97, pl. iv. fig. 3, *Curculionellus glabricollis*, fig. 4, *angulicollis*, fig. 5, *doreyanus*, fig. 5b, p. 98, *Pselaphodes villosus*, fig. 6, *Rhytus vestitus*, fig. 7, p. 99, *Goniastes sulcifrons*, fig. 8, *Bryaxis auritulus*, fig. 9c, *B. coronatus*, fig. 9, p. 100, *Sintectes carinatus*, fig. 10, *Phalepsus subglobosus*, fig. 11, p. 101, *Ryzabis anthicoides*, fig. 12, p. 102.

New genera and species :—

Tetracis, D. Sharp, *Ent. M. M. xi. p. 79*. Between *Tmesiphorus* and *Ctenistes*; also allied to *Centrotoma*. *T. complex*, *id. l. c. p. 80*, Tangiers.

Lasinus, *id. Tr. E. Soc. 1874, p. 106*. Best placed near the N. American *Cedius*, *Ceophyllus*, and *Tmesiphorus*, but with the maxillary palpi as in *Bryaxis*. *L. spinosa*, *id. ibid.*, Japan.

Gerallus, *id. l. c. p. 493*. Allied to *Tyrus* and *Tychus*, but with the antennæ more separated at the insertion, differing also from the former in the elongated maxillary palpi, and from the latter by the elongate intermediate trochanters, double unguiculi, and non-securiform last joint of maxillary palpi. *G. nanus*, *id. l. c. p. 494*, W. Australia, and *Tyrus palpalis*, *subulatus*, and *formosus*, King. The genus also approaches *Bythinus* and *Bryaxis protervus*.

Sagola, *id. l. c. p. 506*. Staphyliniform; very close to *Faronus*, but with middle coxæ separated by a mesosternal process. *S. major*, *prisca*, p. 507, *misella*, *parva*, p. 508, *id. l. c.*, New Zealand.

Stipesa, *id. l. c. p. 108*. Provisionally placed near *Metopias*. *S. rudis*, *id. l. c. p. 109*, Japan.

Tyraphus, *id. l. c. p. 489*. Closely allied to *Pselaphus*, but with 4th joint of maxillary palpi short, stouter than the rest, and sub-triangular. *T. planus*, *ibid.*, *brevis* and *major*, *id. l. c. p. 491*, W. Australia.

Durbos, *id. l. c. p. 495*. Differs from *Bryaxis* in the elongate maxillary palpi and double unguiculi, and from *Gerallus* by the less elongate maxillary palpi, less rostrate head, posteriorly placed eyes, &c. *D. priscus*, *id. ibid.*, W. Australia.

Morana, *id. l. c. p. 117*. Provisionally placed between *Bryaxis* and *Trichonyx*; resembles a compound of the fore-part of an *Euplectus* and the hind-part of a *Bryaxis*. *M. discedens*, *id. l. c. p. 118*, Nagasaki.

Dalma, *id. l. c. p. 504*. Intermediate between *Batrissus* and *Euplectus*, thus merging the *Pselaphini* and *Euplectini*. *D. pubescens*, *id. l. c. p. 505*, New Zealand.

Trogaster, *id. Ent. M. M. xi. p. 83*. Allied to *Euplectus*, but with peculiarly prominent anterior coxæ: facies of *Trichonyx*. *T. aberrans*, *id. ibid.*, Corsica.

Tamotus, L. Schaufuss, Nung. Ot. ii. (1874), p. 288. *T. femoratus*, id. *ibid.*, Cuba.

Listriophorus, id. l. c.; near *Claviger*. *L. felix*, id. l. c. p. 289, Mexico.

Centrotoma prodiga, D. Sharp, Tr. E. Soc. 1874, p. 107, Nagasaki.

Tmesiphorus speratus, id. l. c. p. 109, Japan.

Ctenistes oculatus, p. 110, *armatus*, *medius*, p. 111, *similis*, p. 112, Japan, *impressus*, p. 485, W. Australia, *simplex*, *parvus*, p. 486, Victoria, Sharp, l. c.; *C. oberthuri*, L. Perez Arcas, An. Soc. Esp. iii. p. 117, pl. i. figs. 3 & 4, Escorial.

Tyrus (?) *mutandus*, p. 487, New Zealand, and *T.* (?) *mirandus*, p. 488, Victoria, Sharp, l. c.

Pselaphus mundus, p. 491, *tenuis*, p. 493, Victoria, *pauper*, p. 492, New Zealand, Sharp, l. c., *P. saulcii*, id. Ent. M. M. xi. p. 80, N. Spain.

Tychus cognatus, J. L. Leconte, Tr. Am. Ent. Soc. v. p. 50, Vancouver Island.

Batriscus carinatus, *rhinocerus*, p. 281, *carinifrons*, p. 283, *aubæi*, p. 284, New Friburg, *cornutus*, Brazil, *vividus*, Central America, p. 282, *rivularis*, p. 285, Panama, *curvicornis*, p. 286, Yucatan, Schaufuss, l. c.; *B. sibiricus*, Sharp, Ent. M. M. xi. p. 82, E. Siberia; *B. optatus*, p. 112, *angustus*, p. 113, *ornatus*, p. 114, *stipes*, p. 115, *dissimilis*, *modestus*, p. 116, *id.* Tr. E. Soc. 1874, Japan.

Trichonyx simplex, *gibbus*, p. 287, Amazons, *venustulus*, p. 288, Teapa, Schaufuss, l. c.; *T. striatus*, Leconte, l. c. p. 49, Vancouver Island.

Amaurops (re-characterized pp. 236-239) *diecki*, p. 240, *exaratus*, p. 242, *carinatus*, p. 244, and *pirazzolii*, p. 248, Italy, *corsicus*, p. 245, Corsica, Sardinia, *sardous*, p. 247, Sardinia; F. Baudi di Selve, Atti Ac. Torin, xi., spp. nn. [The first and the last three of these species are, *teste* De Marseul, Nouv. et faits, 1875, No. 7, p. xxvii., published under the same names by De Sauley, in the first part of his "Species des Paussides, Clavigerides, Psélaphides et Scydmenides," Bull. Soc. Metz, not seen by the Recorder, and stated by De Marseul to be really anterior to Baudi's publication.]

Bryaxis princeps, p. 118, *alienus*[-na], p. 120, *protervus*[-va], p. 121, *cubitus*, *mundus*[-da], p. 122, *pullus*[-la], p. 123, *curtus*[-ta], p. 124, *crasipes*, *japonicus*[-ca], p. 125, Japan, *optata*, p. 496, *spretu*, p. 501, *concolor*, *plecta*, p. 502, Victoria, *recta*, p. 493, Paramatta, W. Australia, *sulcata*, p. 503, *euplectodes*, p. 504, W. Australia, *inflata*, *micans*, p. 497, *dispar*, p. 498, *deformis*, p. 499, *impar*, *grata*, p. 500, New Zealand, Sharp, Tr. E. Soc. 1874.

Macherites (*Lindera*) *doriæ*, Schaufuss, l. c. p. 290, La Spezzia.

Bythinus cedipus and *crotchii*, p. 81, N. Spain, *manueli*, p. 82, Savoy, Sharp, Ent. M. M. xi.

Euplectus convexus and *opacus*, id. Tr. E. Soc. 1874, p. 509, New Zealand.

Articerus westwoodi, *tumidus*, p. 510, *pascoeus*[-coianus], p. 511, *brevipēs*, *kingius* [-gi, vel -ganus], p. 512, *gibbulus*, *spinifer*, p. 513, *deyrollii*, p. 514, *id.* l. c. W. Australia.

SCYDMENIDÆ.

Aulacothorax exilis, Boh., is either an Anthribid, allied to *Choragus* or *Xenorchestes*, or a Bruchid, allied to *Urodon*; C. O. Waterhouse, Ent. M. M. xi. p. 137.

Eumicrus vestitus, sp. n., D. Sharp, Tr. E. Soc. 1874, p. 126, Japan.

Scydmanus (*Euconnus*) *japonicus*, *S. debilis*, p. 127, *fustiger*, *reversus*, p. 128, Japan, *optatus*, W. Australia, *edwardsi*, New Zealand, p. 515, *id. l. c.*: spp. nn.

Phagionophana (?) *setosa*, sp. n., *id. l. c.* p. 516, New Zealand.

SILPHIDÆ.

Apatetica nitiduloides, Westw., re-described and figured by the author; *Thesaurus ent. oxon.*, p. 69, pl. v. fig. 11.

Adelops hirtus. Larva found in Salt Cave, Kentucky; eyeless, white, somewhat like larva of *Agathidium*, but head much larger and as wide and long as prothoracic segments. It tapers from prothorax to end, and has long hairs; the antennæ are large and long. A. S. Packard, Jr., Am. Nat. viii. p. 563.

Anisotoma anglica, Rye, = *grandis*, Fairm., of which the chief character is erroneously described by the latter author; E. C. Rye, Ent. Ann. 1874, p. 85.

Liodes humeralis, var. *globosa*, Payk., in England; *id.* Ent. M. M. xi. p. 84.

Scotocryptus, g. n., M. Girard, Bull. Soc. Ent. Fr. (5) iv. p. cv.; Ann. p. 574. Blind. Facies of *Cybocephalus*, *Myrmecobius*, or *Oochrotus*, in widely separated groups, but differing from all in its strictly 3-jointed tarsi: associated with *Catops* and *Adelops*. *S. meliponæ*, sp. n., *id. l. c.* pp. 576, figs. 1-9 (p. 577), parasitic on *Melipona scutellaris* (Hym.), from Bahia.

Silpha ferrugata, sp. n., S. Solsky, Fedchenko's Turkestan, ii. 5, p. 215, Maracand.

Ptoma [to] *phagus leptinoides*, sp. n., G. R. Crotch, Tr. Am. Ent. Soc. v. p. 77, Fort Crook, U. S. A.

Agyrtes ferrugineus, sp. n., Solsky, *l. c.* p. 220, Maracand [evidently = *castaneus*, Fröhl., var.].

Hydnobius matthewsi, G. R. Crotch, *l. c.* p. 74, Vancouver Island; *H. ciliaris*, p. 545, Christiania, *septentrionalis*, p. 546, Lapland, *intermedius*, p. 548, Sweden, Thomson, Opusc. Ent. (vi.): spp. nn.

Anisotoma simplex, p. 542, *humeralis*, p. 543, C. G. Thomson, *l. c.*, Sweden; *A. fracta*, Seidlitz, Fauna Baltica, p. 209, Esthonia; *A. paludicola*, G. R. Crotch, *l. c.* p. 74, San Diego; *A. bicolor*, K. Brancsik, B. E. Z. xviii. pp. 228, Carpathian Mountains: spp. nn.

CLAMBIDÆ.

E. REITTER, Verh. Ver. Brünn, xii. Heft 2, pp. 1-12, gives diagnoses of the (25) known species of *Cybocephalus*, which he considers better 1874. [VOL. XI.]

placed in this family [Zool. Rec. x. p. 260]. *C. seminulum*, Baudi, is treated as a distinct species from *C. metallicus*, Baudi; *C. diadematus*, Chevrr., = *festivus*, Er.; *C. unicolor*, Woll., = *sphærule*, Woll., ♀; *C. atomus*, Bris., = *politus*, Er., nec Gyll., = *atomus*, Germ.

Cybocephalus micans, p. 4, *flaviceps*, p. 8, *membranaceus*, p. 11, Egypt, *nitidissimus*, p. 5, Brazil, *rufifrons*, p. 9, S. Europe, *id. l. c.*: spp. nn.

CORYLOPHIDÆ.

Orthoperus re-characterized, and 5 species recognized; *Dorcatoma zumähusense*, Beck, ? = *O. brunnipes*, Gyl. (note by Kraatz, p. 118): L. v. Heyden, B. E. Z. xviii. pp. 116-118, pl. i. figs. 1a-h. Kraatz, *l. c.* pp. 119-122, discusses 8 European species, of which 7 are considered German; an insect from Upper Silesia, dubiously referred to *O. punctatus*, Wanc., is provisionally named *rogeri*.

TRICHOPTERYGIDÆ.

Actinopteryx australis occurs in New Zealand, and the sexes are very dissimilar in form. A. Matthews, Cist. Ent. pt. xi. p. 295.

Actidium lineare, sp. n., *id. l. c.* p. 296, New Zealand.

Trichopteryx inconspicua, *ibid.*, New Zealand, *mærens*, p. 298, N. America, *id. l. c.*: spp. nn.

Nossidium posthumum, sp. n., *id. l. c.* p. 298, N. America.

SCAPHIDIIDÆ.

Scaphium quadraticolle, sp. n., S. Solsky, Fedchenko's Turkestan, ii. 5, p. 231, Sarafschan Valley.

HISTERIDÆ.

Chlamydopsis douboulayi, Westw., fig. 7, *C. striatella*, Westw., fig. 8, re-described and figured; J. O. Westwood, Thesaurus ent. oxon., p. 68, pl. iii.

Terapus marseuli, sp. n., *id. l. c.* p. 67, pl. iii. fig. 9, Amazon district.

Heterius tristriatus, sp. n., G. H. Horn, Tr. Am. Ent. Soc. v. p. 21, California.

Paromalus difficilis, sp. n., *id. ibid.*, California.

NITIDULIDÆ.

Reitter's monograph [Zool. Rec. x. p. 260] reviewed by Kraatz, B. E. Z. xviii. pp. 238-240.

✓ *Brachypterus testaceus*, Boh., dark form; *Strongylus notatus*, Reitt., = *Camptodes ornatus*, Mots.; *Ips chinensis*, Reitt., = *japonius*, Mots.; E. Reitter, Verh. z.-b. Wien, xxiv. p. 510 *et seq.*

Epuræa diffusa, C. Bris., is quite distinct from *E. 10-guttata*; C. Brisout de Barneville, Bull. Soc. Ent. Fr. (5) iv. p. lxxi.

Meligethes. Observations on British species; E. C. Rye, Ent. Ann. 1874, p. 60 *et seq.*

Meligethes (? *æneus*). Life-history detailed, and egg and larva, &c., figured; E. A. Ormerod, Ent. M. M. xi. pp. 46-52.

Apsectochilus, g. n., Reitter, l. c. p. 512. Between *Pallodes* and *Oxyenemus*. *A. steinheili* and *hydrobioides*, spp. nn., id. l. c. p. 513, Columbia.

Brachypterus metallicus, sp. n. id. l. c. p. 509, Australia.

Colastus yuccæ, p. 75, *agavensis*, p. 76, spp. nn., G. R. Crotch, Tr. Am. Ent. Soc. v., California.

Epuræa horni, Canada, *E. (Dadopora) texana*, Texas, *E. (?) monogama*, Vancouver Island, Sierra Nevada, id. l. c. p. 76; *E. fagi*, C. Brisout, l. c. p. lxxi. Fontainebleau, Germany: spp. nn.

Omosita japonica, sp. n., Reitter, l. c. p. 510, Japan.

Stelidota æqualis, sp. n., id. *ibid.*, Columbia.

Meligethes viridulus, Cape of Good Hope, *subopacus*, Mogador, spp. nn., id. l. c. p. 511.

Cryptarcha meligethoides, sp. n., id. l. c. p. 513, Columbia.

Helota (placed in the *Ipinæ*) *gemmata*, sp. n., H. S. Gorham, Tr. E. Soc. 1874, pp. 447-449, S. E. Japan and Shanghai, feeding in *Cossus* burrows on exuding sap.

Ips clarkana, sp. n., Westwood, Thesaurus ent. oxon., p. 71, pl. v. fig. 10, Brazil.

Pityophagus basalis, sp. n., Reitter, l. c. p. 514, Japan.

Bactridium monstrosus, p. 514, *japonum* and *cribratum*, p. 515, spp. nn., id. l. c., Japan.

TROGOSITIDÆ.

Syntelia indica, Westw., re-described and figured by the author, Thesaurus ent. oxon., p. 71, pl. v. fig. 9 [see Zool. Rec. x. p. 259].

Trogosita yuccæ, sp. n., G. R. Crotch, Tr. Am. Ent. Soc. v. p. 75, California.

Grynocharis [Peltis] pilosula, sp. n., id. l. c. p. 77, Oregon, Vancouver Island.

COLYDIDÆ.

Aprostoma filum, Guér., fig. 7, *planifrons*, Westw., fig. 8, re-described and figured; J. O. Westwood, Thesaurus ent. oxon., p. 70, pl. v.

Cossyphodes raffrayi, sp. n., R. Gestro, Pet. Nouv. vi. p. 443, Abyssinia.

Lasconotus ? linearis, sp. n., G. R. Crotch, Tr. Am. Ent. Soc. v. p. 75, Sta. Inez Mountains.

Oxylemus californicus, sp. n., id. *ibid.*, Sierra Nevada.

CUCUJIDÆ.

Typhlocharis sylvanoides, Dieck, must be placed in the *Carabidæ*, next *Anillus*; E. Abeille, Bull. Soc. Ent. Fr. (5) iv. p. cccxiii. *L. rufus*, Luc., = *ater*, Ol.; *L. suberis*, Luc., = *testaceus*, F.; *L. dufouri*, Lab., = *fractipennis*, Motsch.; A. Grouvelle, *tom. cit.* p. xxix.

Cathartus (?) *advena*, Waltl; full synonymy and references to localities and habits given. E. C. Rye, Ent. Ann. 1874, pp. 88–92.

Microbrontes, g. n., Reitter, Verh. z.-b. Wien, xxiv. p. 520. Entirely of the facies of *Læmophlæus*, but with 5-jointed tarsi in both sexes, the first joint being short. *M. læmophlæoides*, sp. n., *id. ibid.*, Japan.

Passandra elongatula, sp. n., A. Grouvelle, l. c. p. xxvii., Malacca.

Hectarthrum latum, sp. n., *id. l. c.* p. xxviii., Moluccan Archipelago.

Catogenus longicornis, sp. n., *id. ibid.*, Mexico, Texas.

Prostomis americanus, sp. n., G. R. Crotch, Tr. Am. Ent. Soc. v. p. 74, Vancouver Island.

Cucujus mniszcechi, sp. n., Grouvelle, l. c. p. xxviii., Japan.

Telephanus procerulus, p. 520, *argentatus*, *ornatus*, p. 521, *dilutus*, *niger*, p. 523, *paradoxus*, p. 524, Columbia, *humerosus*, *pilicornis*, p. 522, Brazil, *pallidus*, p. 523, Porto Rico; Reitter, l. c., spp. nn.

Læmophlæus prostomoides, p. 516, *dorcoides*, p. 517, *levior*, *fuscicornis*, p. 518, *immundus*, p. 519, *id. l. c.*, Japan; *L. juniperi*, A. Grouvelle, l. c. p. xxviii., France, Austria, Spain (lives in cypress, and is parasitic on *Hylesinus thuyæ*, &c.; Abeille, l. c.): spp. nn.

Cryptamorpha fasciata, sp. n., T. V. Wollaston, Ent. M. M. x. p. 169, Japan.

Pediacus japonicus, sp. n., Reitter, l. c. p. 516, Japan.

Æraphilus syriacus, Syria, *corsicus*, Corsicus; Grouvelle, l. c. p. xxix., spp. nn.

Psammæus 3-guttatus, p. 524, *fasciatus*, *4-maculatus*, p. 525; Reitter, l. c., Japan, spp. nn.

CRYPTOPHAGIDÆ.

Cryptophilus, g. n., E. Reitter, Verh. z.-b. Wien, xxiv. p. 381. Tarsi in both sexes 5-jointed; head with the sides elevato-marginate, thorax entire on the sides, tibiæ thin, dilated towards the apex; first segment of abdomen with an obliquely arcuate sub-elevated line behind the coxæ. *Cryptophagus muticus*, Bris., = *integer*, Heer, *C. braminus* and *ceylonicus*, Mots., and *Cryptophilus obliterated*, *propinquus*, and *glisonothoides*, spp. nn., Reitter, l. c., p. 382, Japan.

Cryptophagus decoratus, *lewisi*, p. 379, *dilutus*, *japonicus*, *pumilus*, p. 380, *micramboides*, p. 381, spp. nn., *id. l. c.*, Japan.

Leucohimatium breve, sp. n., T. V. Wollaston, Ent. M. M. x. p. 170, Japan.

LATHRIDIIDÆ.

Cholovocera attæ, Ktz., parasitic on *Atta structor* at Mentone; H. Lucas, Bull. Soc. Ent. Fr. (5) iv. pp. ccxxxix.

Holoparamesus. 9 species tabulated; the antennæ are 9–11-jointed. T. V. Wollaston, Ent. M. M. x. pp. 200 & 201.

Corticaria pharaonis, Mots.; described and figured in its principal stages. J. Thevenet, Ann. Soc. Ent. Fr. (5) iv. pp. 427–431, pl. x. No. 1.

Derotoma lederi, Reitt., = (*Monotoma*) *sericella*, Rott. ; A. v. Rottenberg, B. E. Z. xviii. p. 331.

Holoparamesus ellipticus, p. 201, *signatus*, *capitatus*, p. 202, *contractus*, p. 203, spp. nn., Wollaston, l. c., Japan.

Corticaria metallica, sp. n., E. Reitter, Verh. z.-b. Wien, xxiv. p. 526, Spain.

MYCETOPHAGIDÆ.

Triphyllus lewisianus, sp. n., T. V. Wollaston, l. c. p. 170, Japan.

Thallestus throscooides, *suffusus*, p. 171, *rufo-pictus*, p. 172, spp. nn., *id. l. c.* Japan.

Typhæa pallidula, Japan, *haagi*, Siam, spp. nn., Reitter, l. c. p. 527.

DERMESTIDÆ.

Trogoderma hieroglyphicum, Ab., = *testaceicorne*, Perr., ♂; E. Abeille, Bull. Soc. Ent. Fr. (5) iv. p. ccxxiii.

Anthrenus infested by *Ichneumon* larvæ ; Am. Nat. viii. p. 564. The posterior hairs of the larva of *Anthrenus* are almost antenniform ; C. E. Leprieur, Bull. Soc. Ent. Fr. (5) iv. pl. lxxii. Three sorts of hairs noted in *A. verbasci* ; Thevenet, *tom. cit.* pp. lxxxiv. & xcvi. The common insect in collections is *A. verbasci*, L., which is not *Attagenus 3-fasciatus*, F. ; *A. museorum* is only an abraded state of it ; L. Reiche, *tom. cit.* p. xciv. ; cf. also p. cxii.

Dermestes signatus, sp. n., J. L. Leconte, Tr. Am. Ent. Soc. v. p. 50, N. and W. America.

Trogoderma belfragii, sp. n., *id. ibid.*, Texas.

Byturus affinis, p. 525, *ferrugineus*, *atricollis*, p. 526, spp. nn., E. Reitter, Verh. z.-b. Wien, xxiv, Japan.

DERODONTIDÆ.

Mycetomychus, Friv. (1866), = *Derodontus*, Lec. (1861) ; E. Reitter, l. c. p. 526.

BYRRHIDÆ.

Nosodendrum californicum, sp. n., G. H. Horn, Tr. Am. Ent. Soc. v. p. 22, California.

GEORYSSIDÆ.

Georyssus californicus, sp. n., J. L. Leconte, Tr. Am. Ent. Soc. v. p. 51, California.

PARNIDÆ.

Elmis volkmari, figs. 1-13, *ceneus*, figs. 14 & 15, and *Psephenus lecontii* (*Fluvicola herricki* and *tuberculata*, De Kay), figs. 16-23, 41-46 ; larvæ figured and very fully described, especially as to internal anatomy : W.

Rolph, Arch. f. Nat. xl. pp. 1-25, 35 & 36, 38-40, pl. i. The somewhat similarly formed *Prosopistoma punctifrons*, Latr. (*Binoculus hemisphaericus*, Geoffr.), is discussed, l. c. pp. 37 & 38.

Elmis (*Limnius*) *trogodytes*, Gyl., re-characterized from British specimens; E. C. Rye, Ent. Ann. 1874, p. 92.

Throscinus, g. n., J. L. Leconte, Tr. Am. Ent. Soc. v. p. 51. Facies of *Throscus*; differs from its ally *Lutrochus* in the longer and slender antennæ and elongate body. *T. crotchii*, sp. n., *id.* l. c. p. 52, California.

Elmis divergens, *seriatus*, California, *corpulentus*, British Columbia, p. 52, *foveatus*, locality unknown, *vulneratus*, *cæsus*, Texas, p. 53, spp. nn., *id.* l. c.

HETERO CERIDÆ.

Elythomerus, g. n., C. O. Waterhouse, Tr. E. Soc. 1874, p. 535, of singularly elongate form; intermediate coxæ contiguous, prosternum not keeled, not visible between anterior coxæ. *E. elongatulus*, sp. n., *id. ibid.*, Queensland.

Heterocerus australasiæ, sp. n., *id.* l. c. p. 536, W. Australia.

LUCANIDÆ.

Sphenognathus pubescens, C. O. Waterh., figured, pl. v. fig. 3; *S. walisi*, Tasch., = *peruvianus*, C. O. Wat.; *Eurytrachelus candezii*, Par., = *eurycephalus*, Burm., which is not *bubalus*, Pty., and the auricular prothoracic impressions are purely accidental. F. J. S. Parry, Tr. E. Soc. 1874, p. 369 *et seq.*

Lucanus elephas with twisted head and abnormally developed right mandible, described and figured; J. O. Westwood, Ent. M. M. xi. p. 34. *Odontolabis striatus*, Deyr., var. from Borneo, p. 360, fig. 4; *Nigidius obesus*, Parry, p. 361, fig. 5; *Gnaphaloryx sculptipennis*, Parry, p. 362, fig. 6; re-described and figured: *id.* Tr. E. Soc. 1874, pl. iii.

Eulepidius, g. vel subg. n. (not stated as to which genus it is in the latter alternative to be referred), *id.* l. c. p. 357. Next *Cyclommatus* and *Prosopocelus*; squamose, as in *Cacostomus*; eyes only slightly incised in front; mandibles as long as the head in ♂, dilated inwardly at the base into a large flat triangular tooth. *E. luridus*, sp. n., *id. ibid.*, pl. iii. fig. 1, Borneo.

Ægotypus, g. n., Parry, l. c. p. 371. Allied to *Ægus* and *Gnaphaloryx*; anterior margin of head reflexed. Type, *Ægus* ? 3-lobatus, Parry.

Sphenognathus nobilis, pl. iv. fig. 1, *signatus*, pl. v. fig. 2, p. 366, *circumflexus*, p. 367, pl. iv. fig. 3, *canaliculatus*, pl. iv. fig. 2, *taschenbergi*, pl. v. fig. 1, p. 368, spp. nn., *id.* l. c., Venezuela.

Lucanus swinhoii, sp. n., *id.* l. c. p. 370, pl. iv. fig. 4, Formosa.

Heterochthes andamanensis, sp. n., Westwood, l. c. p. 359, pl. iii. fig. 2, Andaman Isles.

Prismognathus (*Cyclorasis*) *angularis*, sp. n., C. O. Waterhouse, Ent. M. M. xi. p. 6, Japan.

Leptinopterus fraternus, sp. n., Westwood, l. c. p. 359, pl. iii. fig. 3, Brazil.

Dorcus binodulosus, sp. n., C. O. Waterhouse, l. c. p. 6, Japan.

Ægus grandis, sp. n., H. Deyrolle, Tr. E. Soc. 1874, p. 411, pl. v. fig. 6, Fiji Isles.

Figulus ater, p. 412, Mysol, *punctatostratus*, Timor, Malacca, *rugosus*, Borneo, p. 413, *cambodiensis*, Cambodia, *mediocris*, Borneo, Malacca, *minutus*, Banda, p. 414, Deyrolle, l. c.; *F. interruptus*, India, *nitens*, N. S. Wales, C. O. Waterhouse, l. c. p. 7: spp. nn.

Cardanus levigatus, sp. n., Deyrolle, l. c. p. 412, Philippines and Moluccas.

Mitophyllus marmoratus, sp. n., C. O. Waterhouse, l. c. p. 8, New Zealand.

SCARABÆIDÆ.

J. C. SCHIÖDTE, Ann. Soc. Ent. Fr. (5) iv. pp. 39-41, describes the stridulating organs in the larvæ of Lamellicorn beetles. In the *Dynastides*, *Cetoniides*, *Rutelides*, *Melolonthides*, *Sericides*, and *Coprides*, there is on the upper side of the maxillary stipes a longitudinal ridge, furnished with a row of teeth so placed as to work upon granulations on the lower face of the mandibles, differently situated in various genera specified. In the larvæ of the *Geotrypides*, *Lucanides*, and *Passalides*, stridulation is effected by the contact of granulations on the femora of the first pair of legs and on the trochanters of the third pair, differently disposed in various genera.

The structure of the larvæ of *Xylotrypes*, *Oryctes*, *Parastasia*, *Osmoderma*, *Cetonia*, *Euchlora*, *Phyllopertha*, *Melolontha*, *Rhizotrogus*, *Serica*, *Ateuchus*, *Aphodius*, *Ammæcius*, *Geotrypes*, *Lucanus*, *Dorcus*, *Platycerus*, *Sinodendrum*, and *Passalus* is very elaborately discussed and compared under all the principal organs by this author, Nat. Tids. (3) ix. pp. 227-287, in a manner incapable of abstraction. The following are described and figured in detail:—*Xylotrypes gideon*, pp. 287-290, pl. viii. figs. 1-7, *Oryctes nasicornis*, pp. 290-293, pls. ix. figs. 1-8, xix. figs. 1 & 2, *Parastasia confluens*, pp. 294-296, pls. x. figs. 1-10, xix. fig. 3, *Osmoderma eremita*, pp. 297-300, pl. xi. figs. 1-12, *Cetonia ænea*, pp. 300-303, pls. xi. figs. 13-20, xix. fig. 4, *Euchlora frischi*, pp. 304-307, pls. xii. figs. 1-7, xix. fig. 5, *Phyllopertha horticola*, pp. 307-310, pls. xii. figs. 8-14, xix. figs. 6 & 7, *Melolontha vulgaris*, pp. 310-313, pls. xiii. figs. 1-5, xix. figs. 8 & 9, *M. hippocastani*, p. 313, *Rhizotrogus falleni*, pp. 314-317, pls. xii. figs. 6-12, ix. fig. 9, *Serica brunnea*, pp. 317-320, pl. x. figs. 10-13, *Ateuchus semipunctatus*, pp. 321-324, pl. xiv. figs. 1-9, *Aphodius rufipes*, pp. 324-327, pls. xiv. figs. 10-16, xix. fig. 10, *A. granarius*, p. 327, *A. fossor*, p. 328, *Ammæcius brevis*, pp. 328-331, pls. xv. figs. 1-4, xix. fig. 11, *Trox sabulosus*, pp. 332-335, pls. xv. figs. 5-11, xix. fig. 12, *Geotrypes stercorarius*, pp. 336-340, pls. xvi. figs. 1-18, xix. fig. 13, *Lucanus cervus*, pp. 342-345, pl. xv. figs. 12-15, *Dorcus parallelipipedus*, pp. 345-349, pls. xvii. figs. 1-10, xix. figs. 14 & 15, *Platycerus caraboides*, pp. 349-352, pl. xvii. figs. 11-21, *Sinodendrum cylindricum*, pp. 353-356, pls. xviii. figs. 1-10, xix. fig. 16, *Passalus cornutus*, pp. 356-359, pls. xviii. figs. 12-19, xix. fig. 17.

The pupæ of *Oryctes*, *Parastasia*, *Euchlora*, *Phyllopertha*, *Melolontha*, *Rhizotrogus*, *Serica*, *Aphodius*, *Geotrypes*, *Dorcus*, *Platycerus*, *Sinodendrum*, and *Passalus* are also described and systematically classed; *id. tom. cit.* pp. 360–367.

[The *Lucanidæ*, included by Schiödte with the *Scarabæidæ*, are associated in the above notice with the latter family.]

Coprides.

H. BURMEISTER, S. E. Z. xxxv. pp. 120–133, under the heading “*Lamellicornia Argentina*,” continues his revision of the *Coprides* of the La Plata district [Zool. Rec. x. p. 269]. *Copris rotundatus*, Blanch., is a *Selenocopris*, not an *Ontherus*; *Gromphas inermis*, Har., = *lacordairii*, Dej.

G. VAN LANSBERGE, Ann. Ent. Belg. xvii. pp. 177–193, discusses the *Ateuchides*, in the commencement of a series of articles, entitled Observations on the Classification of Coprophagous Lamellicorns. He considers that Lacordaire's classification cannot be maintained, Burmeister's being still more artificial, and that the modifications presented by the position of the intermediate coxæ, with the corresponding formation of the meso- and metasternum, suffice to establish 3 natural groups:—1, true *Ateuchides* (*a*, apterous, Eucranides, *Eucranium*, *Anomiopsis*, *Glyphiderus*, *Pachysoma*, *Mnematum*; *b*, winged, *Ateuchides* s. s., *Pachylomera*, *Scarabæus*, *Circellium*, *Sceliages*, *Gymnopleurus*), having the intermediate coxæ approximated and strongly oblique; 2, *Canthonides* (*a*, true *Canthonides*, *Megathopa*, *Canthon*, *Stenodactylus*, *Deltachilum*; *b*, *Minthophilides*, *Anachalcos*, *Gyronotus*, *Byrrhidium*, *Epilissus*, *Monoplistes*, *Temnopectron*, *Tesserodon*, *Saphobius*, *Cephalodesmus*, *Canthosoma*, *Aulacopris*, *Onthobium*; *c*, *Epirinides*, *Copræcus*, *Streblopus*, *Labroma*, *Epirinus*, *Minthophilus*), having the intermediate coxæ separated and moderately oblique; 3, *Sisyphides* (*Amphistomus*, *Sisyphus*, *Eurysternus*, *Drepanocerus*), having the intermediate coxæ widely separated and parallel, and the metasternum occupying almost all the breast.

Mnematum and *Pachylomera* are distinct from *Scarabæus*; *M. multidentatum*, Klug, belongs to the winged section, and a new genus, *Octodon*, is proposed for its reception (p. 183); Von Harold's restoration of *Scarabæus* for *Ateuchus* is adopted [the latter name being dropped, it seems unreasonable to call the group *Ateuchides*]; *Sebasteos* cannot be separated from *Scarabæus*. *Megathopa* may be transferred to the 1st group, after *Gymnopleurus*; Burmeister's adoption of *Coprobis* for *Canthon* is rejected; a new genus, *Gyronotus*, is proposed (p. 186) for *Chalconotus pumilus*, Boh.; and another, *Monoplistes* (p. 187), for an Australian species near *Epilissus*; *Homodesmus*, Shp., = *Canthosoma*, McL. [E. von Harold, C. H. xii. p. 131]; a new genus, *Streblopus* (p. 187) is indicated for a Brazilian representative of the *Epirinides*. *Merodontus*, McL., nec Jekel, is re-named *Amphistomus* (p. 190) [—ma, Rud., Vermes]: C. O. Waterhouse, Tr. E. Soc. 1874, p. 537, re-names this genus *Platypymatia*.

Aulacopris, White (re-characterized), is a distinct genus; C. O. Waterhouse, l. c. p. 536.

Anachalcos cupreus, Hope, nec Ol., = *Onitis olivieri*, Ill., = *O. sphinx*, Ol., nec F., = *O. belial*, Fab.; E. v. Harold, C. H. xii. p. 3.

Onthophagus angulatus, Redt., = *gagates*, Hope; *Oniticellus brama*, Redt., = *gagatinus*, Hope; *id. l. c. p. 94*.

Monoplistes, g. n., Lansberge, C. H. xii. p. 8 (& *suprà*). Very near *Epilissus*, but without epipleuræ, and having a single spine to the middle tibiæ; intermediate coxæ very oblique; unites *Epilissus* and *Temnoplectrum*. *M. haroldi*, sp. n., *id. l. c. p. 9*, W. Australia.

Streblopus, g. n., *id. l. c. p. 9* (& *suprà*). Approaches *Deltochilum*, but with the tarsi and mesosternum of the *Minthophilides*, the pygidium of *Byrrhidium* and *Copræcus*, the elytra and posterior tibiæ of *Minthophilus*, and the thoracic basal impressions and front tibiæ of *Onitis*. *S. [h]opatroides*, g. n., *id. l. c. p. 10*, Bahia.

Pteronyx, g. n., *id. l. c. p. 12*. Form and tibiæ of *Canthidium*, antennæ and metasternum of *Phanæus*. *Pt. dimidiatus*, sp. n., *id. ibid.*, Brazil.

Ennear [*h*] *abdu*s, g. n., *id. CR. Ent. Belg. 1874*, p. cxliii. Type, *Onthophagus lobocephalus*, Har.

Pachylomera opaca, sp. n., *id. C. H. xii. p. 4*, Lake N'Gami.

Scarabæus pubiventris, sp. n., *id. l. c. p. 5*, Mozambique.

Megathopa picea, sp. n., Burmeister, S. E. Z. xxxv. p. 120, Montevideo.

Canthon granadensis, p. 5, New Granada, *nigripennis*, p. 6, Bahia, Lansberge, *l. c. spp. nn.*

Deltochilum orbiculare, sp. n., *id. ibid.*, Bahia.

Epilissus ustulatus, p. 7, Queensland, *niger*, p. 8, Wide Bay, *id. l. c., spp. nn.*

Minthophilus tuberculatus, sp. n., C. O. Waterhouse, Ent. M. M. x. p. 176, Australia.

Platyphymatia (*Merodontus*, McL., nec Jek.) *æneopicea*, sp. n., *id. Tr. E. Soc. 1874*, p. 537, Queensland.

Temnoplectrum læve, *id. Ent. M. M. x. p. 175*, Queensland (♂, *id. Tr. E. Soc. 1874*, p. 527); *T. parvulum*, *id. Ent. M. M. x. p. 175*, S. Japan: *spp. nn.*

Uroxys tuberculatus, sp. n., Lansberge, *l. c. p. 10*, Brazil.

Cheridium vigilans, sp. n., *id. l. c. p. 11*, Brazil.

Catharsius birmanensis, sp. n., *id. ibid.*, Burmah.

Synopsis ritsemæ, sp. n., *id. CR. Ent. Belg. 1874*, p. cxliii. Java.

Ontherus aphodioides, p. 126, Montevideo, *contractus*, p. 127, Tucuman, *spp. nn.*, Burmeister, S. E. Z. xxxv.

Aphodiides.

Aphodius angularis, *hyperboreus*, and *omissus* (= *concavus*, Hald.), Lec., *sagittarius*, Har., *validus*, *occidentalis*, and ? *torpidus*, Horn, and *pinguis*, Hald., = *hamatus*, Say; *A. longitarsis*, Har., = *peruanus*, Er.; *A. lutarius*, F., = *tomentosus*, Müll.; and many species are described, in continuation of the author's "Beiträge zur Kenntniss einiger coprophagen Lamellicornien" (viii.). E. v. Harold, B. E. Z. xviii. pp. 177-208.

Aphodius contaminatus, Hbst., and *obliteratus*, Pz.: M. des Gozis, Bull. Soc. Ent. Fr. (5) iv. p. ccxxxviii. considers the latter to be founded on

abraded specimens of the former ; an erroneous idea corrected by G. Kraatz, *tom. cit.* p. celix.

Aphodius (Melinopterus) syriacus, Muls. & R., = *prodromus*, Brhm. ; E. v. Harold, C. H. xii. p. 103.

Atænius. E. v. Harold, *l. c.* pp. 15-25, describes the species with toothed clypeus.

Aphodius nobilis, p. 176, S. Africa, Abyssinia, *indutilis*, p. 178, *lansbergii*, p. 179, Mexico, *anomalus*, p. 185, ? Chili, *fulvescens*, p. 189, Senegal, *pilosus*, p. 190, Hindostan, *ibericus*, p. 203, Madrid, *sharpi*, p. 205, Algeria, Spain, *tranquebaricus*, p. 208, Tranquebar, *id.* B. E. Z. xviii. ; *A. (Otophorus) brachysomus*, S. Solsky, C. H. xii. p. 13, E. Siberia : spp. nn.

Atænius steinheili, p. 18, New Granada, *horni*, p. 19, S. Carolina, *lecontei*, Carolina, *carinator*, Venezuela, p. 20, *attenuator*, p. 22, Columbia, New Granada, Mexico, *texanus*, p. 23, Texas, *figurator*, p. 24, Louisiana, E. v. Harold, C. H. xii. ; *A. socialis*, *id.* B. E. Z. xviii. p. 174, N. America ; *A. haroldi*, E. Steinheil, Atti Soc. Ital. xv. p. 556, S. Argentine States : spp. nn.

Tolosides.

This name suggested for a new group, to be placed near the *Aphodiides*, containing the genera mentioned *infra*, and probably *Eremazus*, Muls., and *Ægialia marmottani*, Fairm. (? = *E. unistriatus*, Muls.). The chief character is in the ventral portion of the hind-body, which is quite that of the *Trogides*. D. Sharp, Ent. M. M. xi. pp. 123 & 124.

Millengenia, g. n., *id.* l. c. p. 124. Facies of *Ægialia*. *M. fossor*, sp. n., *id.* l. c. p. 125, Cairo.

Tolitus, g. n., *id.* l. c. p. 125. Facies of *Aphodius* ; differs from *Millengenia* in its larger eyes, which are concealed under the front angles of the thorax, and its bi-unguiculate tarsi. *T. æneus*, Arabia and W. Syria, *minor*, N. W. India, *id.* l. c. p. 126, spp. nn.

Orphnides.

Orphnus strobili, sp. n., Steinheil, *l. c.* p. 556, Bahia.

Hybosorides.

Pachyplectrus, g. n., J. L. Leconte, Tr. Am. Ent. Soc. v. p. 53. No comparative characters given. *P. lævis*, sp. n., *id.* l. c. p. 54, California.

Geotrypides.

Geotrypes stercorarius and allies. Observations on Von Harold's resurrection of Marshamian species ; E. C. Rye, Ent. Ann. 1874, p. 93 *et seq.*

The Belgian species discussed, following Harold ; A. de Borre, CR. Ent. Belg. 1874, pp. cxxiv.-cxliii.

Typhæus vulgaris. Notes on its habits, &c. ; G. B. Corbin, Ent. vii. pp. 132 & 182.

Pleocomides.

Plecoma. J. L. Leconte, *l. c.* pp. 81-84, discusses the species, of which he recognizes and describes four :—*P. fimbriata*, Lec., *behrensi*,

sp. n. (p. 83), California, *hirticollis*, Schaaf., and *staff*, Schaaf. (re-named *edwardsi*, the author not admitting Crotch's proposed name, *adjuvans*). The variations in the structure of the antennæ of these species are described and figured. A larva is described and figured by R. Osten Sacken, *tom. cit.* pp. 84-87, which is referred to *Pleocomia*, but with no attempt at evidence of its really belonging to that genus. Its mandibles change after moulting. This larva seems to oscillate between the *Trogides* and *Geotrypides*, inclining to the former.

Trogides.

E. v. Harold, C. H. xii. pp. 26-51, describes the cylindrical species. *Sphæromorphus*, Germ., = *Acanthocerus*, McL.; *A. humeralis*, Er., and *sesquistriatus*, Germ., are probably sexes of the same species, and the latter name will in that case stand; *Acanthocerus*, Germ., nec McL., = *Clæotus*, Germ.; *Liparochnus oblongus*, Har., = *Antiochnus brunneus*, Shp., but *Antiochnus* is not generically distinct from *Liparochnus*. *Cæloides bimaculatus*, W. McL., = *L. fossulatus*, Westw. *Sphæromorphus acromialis* and *wallacii*, Pasc., from Singapore and Borneo, queried as being better referred to *Synarmostes*; id. S. E. Z. xxxv. p. 285.

G. H. Horn, Tr. Am. Ent. Soc. v. pp. 1-12, supplements Harold's monograph [Zool. Rec. ix. p. 266] by describing the American species. *T. suturalis* and *umbonatus*, Lec., = *scutellaris*, Say; *T. alternans*, Lec., nec McL., re-named *lecontei* by Harold, = *sonora*, Lec.

Trox gemmulatus, sp. n., id. l. c. p. 8, San Diego.

Acanthocerus redtenbacheri, p. 31, *setulosus*, p. 32, Columbia, *pygmaeus*, p. 33, Surinam, *gundlachi*, p. 34, Cuba, *micans*, p. 36, *undulatus*, p. 38, *aureolus*, p. 40, Brazil, Harold, C. H. xii. spp. nn.

Clæotus metallicus, p. 45, Ega, Bogotá, *batesi*, Ega, *puncticollis*, Columbia, p. 46, id. l. c.; *C. variolosus*, id. S. E. Z. xxxv. p. 285, Penang: spp. nn.

Liparochnus multistriatus, p. 48, Rockhampton, *silphoides*, p. 49, N. S. Wales, id. C. H. xii. spp. nn.

Synarmostes gestroi, sp. n., id. S. E. Z. xxxv. p. 286, Sarawak.

Melolonthides.

Pachytricha anatomically re-characterized, and considered the little changed descendant of one of the more primitive forms of the *Scarabæide*; D. Sharp, Ent. M. M. xi. p. 2.

Amphimallus cantabricus, Heyd., = *Rhizotrogus lusitanicus*, Gyll. (pl. ii. fig. 1), of which the ♀ is mentioned. *R. flavicans*, Blanch., and *chevrolati*, Graells, are perfectly distinct. L. Perez Arcas, An. Soc. Esp. iii. pp. 123-130.

Lachnosterna quercina. General account, and figures of chief stages; G. Geddes, Canad. Ent. vi. pp. 67-69, fig. 8.

Anozia derelicta, Desbr., is possibly only a var. of *emarginata*, Coq., from which *lucasi*, Coq., is certainly distinct; J. Desbrochers des Loges, Ann. Soc. Ent. Fr. (5) iv. p. 82.

Melolontha vulgaris. A. Villa has published a paper on the periodical appearance of this insect; Milan, 1873, 8vo. *M. vulgaris* and *hippocastani* in Scotland; J. B. Syme, Scot. Nat. ii. p. 204.

Pachypus cornutus. The ♀ attracts the males, precisely after the method known to English collectors by the term "sembling." E. Perris, quoting Revelière's observations, Pet. Nouv. vi. p. 384.

Euchriides. H. Deyrolle, Ann. Soc. Ent. Fr. (5) iv. pp. 443-450, pl. ix., revises this group. Lacordaire has taken the epistoma for the labrum, in his characters of *Euchirus*, and the agglutinated cilæ of the labrum for the labrum itself in *Propomacrus*. *Chirotonus* is not generically distinct from the latter, of which 4 species are recognized, 2 being known of *Euchirus*. Various parts (especially the epistoma and labrum) are figured of *E. longimanus* and *dupontianus*, and *P. parrii*, *macleayi*, and *bimucronatus*, pl. ix. figs. 3-11, 13.

Hymenoplia illigeri, sp. n., L. Perez Arcas, l. c. p. 120, pl. ii. fig. 3, Portugal.

Pachytricha munda, p. 3, *pallens*, *robusta*, p. 4, *tecta*, *minor*, p. 5, spp. nn., D. Sharp, l. c. W. and N. W. Australia.

Isonychus maculatus, sp. n., C. O. Waterhouse, Ent. M. M. x. p. 203, Granada.

Gama squamiventris, sp. n., E. Steinheil, Atti Soc. Ital. xv. p. 558, S. Argentine States.

Rhizotrogus parvicollis (in error *laticollis*, p. 153), sp. n., L. Perez Arcas, l. c. p. 126, pl. ii. fig. 2, Spain.

Anozia luteipilosa, p. 82, Algeria, *hungarica*, p. 83, Hungary, Desbrochers, l. c. spp. nn.

Elaphocera elongata, p. 311, *Ætolia affinis*, *suturalis*, p. 312, S. Spain; L. Schaufuss, Nunq. Ot. ii. spp. nn.

Propomacrus davidi, sp. n., H. Deyrolle, Bull. Soc. Ent. Fr. (5) iv. p. cx., and Ann. p. 448, pl. ix. figs. 1 & 2, 12, Kiang-Si, Central China.

Rutelides.

Pelidnota punctata. On its habits in Canada; W. Saunders, Canad. Ent. vi. pp. 141 & 142, with borrowed cut.

Calloodes, White, distinguished from *Anoplognathus*; C. O. Waterhouse, Tr. E. Soc. 1874, p. 539.

Rutelarcha, g. n., *id.* Ent. M. M. xi. p. 52. Differs from *Rutela* in having the large claw of all the tarsi bifid at apex, &c. *R. 4-maculata*, sp. n., *id.* l. c. p. 53, Penang.

Rutela sanguinolenta, sp. n., *id.* l. c. p. 53, New Granada (and var. *rufipennis*, Columbia, p. 54).

Pelidnota chrysargyrea, A. Sallé, Ann. Soc. Ent. Fr. (5) iv. p. 362, Costa Rica; *P. lugubris*, J. L. Leconte, Tr. Am. Ent. Soc. v. p. 54, Arizona: spp. nn.

Anoplognathus 4-lineatus, sp. n., C. O. Waterhouse, Tr. E. Soc. 1874, p. 538, Queensland.

Tribostethus testaceus, sp. n., E. Steinheil, Atti Soc. Ital. xv. p. 559, Rosario.

Dynastides.

Cyclocephala metrica, sp. n., *id. ibid.*, S. Argentine States.

Ligyrrus burmeisteri and *patagonus*, spp. nn., *id.* l. c. p. 560, S. Argentine States.

Scaptophilus cornutus, sp. n., *id. l. c.* p. 561, Bahia.

Bothynus minor, sp. n., *id. ibid.*, Patagones.

Cetoniides.

Observations on Mohnike's species from the Philippine Isles; E. T. Higgins, P. E. Soc. 1874, p. iv. *Phædimus jagori*, Gerst., ? = *cumingi*, var.

Goliathus kirkianus, Gray, = *albo-signatus*, Boh., p. 2, pl. i. fig. 2; *Megalorhina harrisi*, Westw., ♀, from Guinea, p. 3, pl. i. fig. 6; *Euremina agnella*, Westw., from Penang, p. 4, pl. i. fig. 4; re-described and figured, J. O. Westwood, Thesaurus ent. oxon. (*cf.* also as to the first, Tr. E. Soc. 1874, p. 473, pl. vii. fig. 1).

Lomaptera. Stridulating organs exist (in both sexes) in one group (*L. latreillii* and allies), consisting of raised striated spaces on the sides of the 2nd and 3rd abdominal segments, which are acted upon by the coarsely lined inner surface of the hind femur. A difference in this structure exists between *L. fasciata*, Burm., and *L. bivittata*, Gory, erroneously considered as one species. D. Sharp, Ent. M. M. xi. p. 136.

Hemipharis castanea, fig. 1, *Diaphonia mniszcechi*, fig. 2, *Schizorhina concinna*, p. 3, *Diaphonia parrii*, fig. 4, *D. gulosa*, fig. 5, and *Eupæcila inscripta*, fig. 6, described by O. E. Janson, Cist. Ent. p. vi. (Zool. Rec. x. p. 275), figured, *op. cit.* pt. viii. pl. vi. *Schizorhina ocellata*, McL., = *Diaphonia obliquata*, Westw., ♂; figured, *id.* pt. ix. pl. vii. fig. 4; *Diaphonia vicina*, O. E. J., fig. 2, *Eupæcila pullata*, O. E. J., fig. 5, figured, *id. l. c.*

Parachilia bufo, G. & P., p. 475, fig. 7, *Anatona albo-guttata*, Burm., p. 476, fig. 4, pl. vii.; *Anochilia (Pygora) conjuncta*, G. & P., p. 478, fig. 5, *Stalagmosoma scalare*, G. & P., fig. 3, pl. viii.; re-described and figured, and a var. *nigriceps* of the last species from tropical W. Africa described, p. 480; J. O. Westwood, Tr. E. Soc. 1874.

Cetonia aurata flying in mid October; J. Scott, E. M. M. x. p. 178.

Uloptera planata, Burm.: maxillary palpus figured, Westwood, Thesaurus ent. oxon., p. 7, pl. viii. fig. 2.

The *Cremastochilides* re-characterized, and a table of the known genera given; *id. l. c.* pp. 5 & 6. The following species are re-characterized (with others) and figured:—

Macroma scutellata, F., pl. vi. fig. 1, *M. abyssinica*, Schaum, = *confusa*, Hope, fig. 2, p. 8; *M. cognata*, Schaum, fig. 3, *M. bilineata*, Buq., fig. 5, p. 9; *M. emarginicollis*, Sch., fig. 11, p. 10; *M. mirabilis*, Fald., fig. 4, *M. xanthorhina*, Hope, fig. 6, p. 11; *M. nigripennis*, Hope, = *melanopus*, Sch., fig. 8, *M. nigripennis*, Sch., fig. 7, p. 12; *M. javanica*, G. & P., fig. 9, *M. maculicollis*, Sch., fig. 10, p. 13; *M. gloriosa*, Mohn., pl. vii. fig. 1, p. 14. *Cym[at]ophorus hilaris*, Schm., pl. viii. fig. 10; *C. fluctiger* (? sp. n.), fig. 6, p. 16; *C. leucostictus*, Schm., fig. 4, *C. margaritifera*, Schm., fig. 5, p. 17; *C. laticollis*, Westw., fig. 8, *C. intrusus*, Blanch., fig. 7, p. 18 [where *C. spiniventer*, G. & P., is wrongly altered to *spiniventris*]; *C. undatus*, Kby., fig. 3, p. 19. *Rhagoptyx brahma*, G. & P., p. 19, fig. 9. *Aspilus gambiensis*, Burm., p. 20, fig. 11. [*H*] *Oplostomus cribrerosus*, G. & P., pl. ix. fig. 7, p. 21, *platycephalus*, Schm., fig. 8, p. 22. *Problerhinus mouf-*

fleti, Deyr., pp. 22 & 23, pl. vii. fig. 5. *Centrogathus subrugosus*, Guér., p. 29, pl. ix. fig. 4. *Spilophorus plagosus*, Westw. (of which *lugubris*, F., is ? a rubbed example), *ibid.* pl. ix. fig. 6. *Trogodes rotundicollis*, Westw., pp. 30 & 31, pl. xi. fig. 1. *Plinurgus hirtus*, G. & P., pl. ix. fig. 2, *P. subundatus*, Westw., fig. 1, p. 32. *Trichoplus laevis*, G. & P., pl. ix. fig. 9, *schaumi*, Westw., fig. 10, p. 33. *Cenochilus paulus*, G. & P., = *maurus*, F., p. 34, pl. xi. fig. 5, *paulus*, Burm., = *procerus*, Schm., fig. 8, *brou*, G. & P., = *ventricosus*, Gyl., fig. 11, p. 36, *glabratus*, Westw., pl. xii. fig. 9, p. 37, *appendiculatus*, Gerst., pl. xiii. fig. 2, p. 38, *sulcatus*, Schm., pl. xi. fig. 10, p. 41, *setosus*, Burm., pl. xii. fig. 8, p. 43, *trabecula*, Schm., pl. xiii. fig. 10, *campbelli*, Saund. (*platyrhinus*, Schm.), pl. xiii. fig. 5, p. 44, *brunneus*, Saund., pl. xiii. fig. 3, p. 45. *Genuchus elongatulus*, G. & P., pl. x. fig. 1, *nigriclavus*, fig. 3, p. 49. *Lissogenius conspersus*, Burm. (*luteo-varius*, Boh.), p. 50, pl. x. fig. 11. *Scaptobius caffer*, Schm., pl. x. fig. 8, *capensis*, G. & P., fig. 6, p. 52, *aciculatus*, Schm., fig. 9, *natalensis*, Westw., fig. 10, p. 53. *Cyclidius elongatus*, Ol., pl. xi. fig. 2, p. 54, *lacordairii*, Thoms., fig. 3, p. 55. *Psilocnemis leucosticta*, Burm., p. 56, pl. ii. fig. 4. *Cremastochilus castaneæ*, Kn. (*nec* Schm., Burm., or Kby.), p. 59, pl. xiv. fig. 4, *sayi*, Harr., = *variolosus*, Kby. (*nec* Schm., or Burm.), fig. 7, *aquamulosus*, Lec., p. 60, *planatus*, Lec., fig. 5, p. 62, *angularis*, Lec., fig. 1, *nitens*, Lec., fig. 2, p. 63, *knocki*, Lec., fig. 6, p. 64, *schaumi*, Lec. fig. 3, p. 65. *Yncala calabarina*, Westw., p. 4, pl. i. fig. 3.

New genera and species :—

Goliathinus, sub-g. of *Goliathus*, for *G. fornassinii*, Bert., of which ♂, from Zambesi, described and figured ; Westwood, l. c. pp. 2 & 3, pl. i. fig. 1.

Asthenorhella [!], *id.* l. c. p. 3 ; differs from *Asthénorhina* in its bituberculate clypeus, rounded thorax, punctate elytra, and obtusely 3-dentate anterior tibiae, which are not attenuated behind the middle. *A. leonina*, *id.* l. c. p. 4, pl. i. fig. 5, Sierra Leone.

Phymatopteryx [-rus, Westw.], *id.* l. c. p. 7. Allied to *Uloptera*, but with minute maxillary palpi, a distinct prosternal process, and the elytral disc irregularly raised. *P. sculptilis*, *id. ibid.*, pl. viii. fig. 1, Guinea.

Macromina, *id.* l. c. p. 15. Differs from *Macroma* in its small size, hexagonal prothorax and colouring. *M. angulicollis*, *id. ibid.* pl. vii. fig. 3, N'Gami.

Praona, *id.* l. c. p. 20. Differs from *Aspilus* (p. 6) in having the mentum wide in front and rounded at the sides. *P. niveo-sparsa*, *id. ibid.* pl. xiii. fig. 1, Mindanao.

Platysodes, *id.* l. c. p. 23. Allied to *Hoplostomus* ; broad, flat, dark, almost impunctate, mentum entirely closing the mouth beneath. *P. verlorenei*, *id. ibid.* pl. vii. fig. 4, Java.

Genuchinus, *id. ibid.* Allied to the African *Genuchus*, differing from the new-world *Cremastochili* in its narrow form and much narrower mentum. *G. v-notatus*, pl. x. fig. 4, *sulcipennis*, pl. ii. fig. 3, p. 24, *velutinus*, pl. x. fig. 5, p. 25, Central America.

Callynomes [*Callin.*], *id.* l. c. p. 26. First antennal joint and mentum very large, tarsi 4-jointed in both sexes. *C. vollenhovii* [-hoveni], Java,

fig. 6, *jucundus*, Siam, fig. 7, p. 26, *mandarinus*, fig. 8, p. 27, China, *id. l. c.* pl. vii. [this genus = *Cholerastoma*, Mohn. ; *l. c.* p. 66].

Cyclidinus, *id. l. c.* p. 55. Differs from *Cyclidius* in its small size, silky covering, more slender legs (anterior tibiæ without a triangular lobe on the under surface), and more regularly transversely ovate mentum. *C. lugubris*, *id. l. c.* p. 56, pl. xi. fig. 4, Amazon River, *velutinus*, p. 204, locality unknown.

Goliathus higginsii, *id. l. c.* p. 2, pl. ii. fig. 7, Tropical Africa.

Allorhina hypoglaucia, *id. Tr. E. Soc.* 1874, p. 475, pl. vii. fig. 6, Nicaragua.

Gymnetis subpunctata, *id. l. c.* p. 474, pl. vii. fig. 5, Ecuador.

Clinteria 3-colorata, *id. l. c.* p. 477, pl. viii. fig. 4, India.

Agestrata samson, D. Sharp, Ent. M. M. xi. p. 35, Silhet.

Lomaptera higginsii, O. E. Janson, Cist. Ent. pt. xi. p. 339, pl. ix. fig. 2 (not issued), Borneo ; *L. albertsi*, p. 427, and *L. xanthopyga*, p. 451, R. Gestro, Pet. Nouv. vi. New Guinea.

Chalcothea auripes, Westwood, Tr. E. Soc. 1874, p. 474, pl. vii. fig. 2, Borneo.

Anochilia marginicollis, sp. n., *id. l. c.* p. 479, pl. viii. fig. 7, Madagascar.

Hemipharis torrida, sp. n., O. E. Janson, *l. c.* pt. ix. p. 237, N. W. Australia.

Diaphonia ruficornis, Westwood, *l. c.* p. 477, pl. viii. fig. 6, Australia ; *D. digglesii*, p. 238, fig. 1, Queensland, *lacunosa*, p. 239, fig. 3, and *maura*, p. 240, fig. 4, W. Australia, O. E. Janson, *l. c.* pl. vii.

Euryomia 4-maculata, Westwood, *l. c.* p. 477, pl. viii. fig. 8, Madagascar.

Glycyphana mediata, *id. l. c.* p. 476, pl. vii. fig. 3, Borneo.

Pachnoda hilaris, *id. l. c.* p. 478, pl. viii. fig. 2, Sierra Leone.

Stalagmosoma 4-guttata [-tum], *id. l. c.* p. 480, pl. viii. fig. 1, Angola.

Macroma lutescens, *id. Thesaurus ent. oxon.*, p. 10, pl. 7, fig. 2, Natal.

Spilophorus aurifer, *id. l. c.* p. 30, pl. ix. fig. 5, Guinea.

Plinurgus despectus, *id. l. c.* p. 32, pl. ix. fig. 3, Siam.

Cœnocilus turbatus, p. 37, pl. xii. fig. 7, *analis*, p. 39, pl. xii. fig. 10, Natal, *castaneus*, p. 38, pl. xi. fig. 9, Abyssinia, *calcaratus*, p. 39, pl. xii. fig. 3, *crassipes*, p. 42, fig. 5, *angustatus*, p. 43, fig. 6, W. Africa, *armiger*, fig. 2, S. Africa, *niloticus*, fig. 11, White Nile, p. 40, pl. xii., *emarginatus*, p. 41, fig. 1, *corniger*, p. 42, fig. 4, S. W. Africa, *javanicus*, p. 45, pl. xiii. fig. 9, Java, *striatus*, fig. 7, Hong Kong, *taprobanicus*, Ceylon, fig. 8, p. 46, *apicalis*, fig. 4, Siam, *curtipes*, fig. 6, Assam, p. 47 ; *id. l. c.* spp. nn.

Genuchus perditus, *id. l. c.* pp. 50 & 203, pl. x. fig. 2, Guinea.

Scaptobius pentarthrius, *id. l. c.* p. 52, pl. x. fig. 7, Natal (? = *capensis*, G. & P.).

Cremastochilus cicatricosus, p. 60, pl. xiv. fig. 9, S. Carolina, *percheroni*, Westw. (*variolosus*, Schm., Burm., *nec* Kby. ; *castaneæ*, G. & P., *nec* Knoch, &c.), p. 61, pl. ii. fig. 5, S. Carolina, *crenicollis*, p. 65, pl. ii. figs. 6 & 6a, New Mexico, *id. l. c.* ; *C. crassipes*, *id. Ent. M. M.* xi. p. 55, & *l. c.* p. 204 ; *C. crinitus*, J. L. Leconte, Tr. Am. Ent. Soc. v. p. 55, ? Utah.

BUPRESTIDÆ.

E. SAUNDERS, Tr. E. Soc. 1874, pp. 303-328, in "Notes on the *Buprestidæ* collected by Professor Semper in the Philippine Islands" (58 species), describes 36 as new. In general facies, the species are almost similar to those of the Moluccan Isles.

Stigmodera. The sculpture is coarser in the ♀ than the ♂; C. O. Waterhouse, Tr. E. Soc. 1874, p. 544.

Anthaxia ditiescens, Ab., = *viminalis*, Cast.; *Agrilus sulcaticeps*, Ab., = *cæruleus*, Rossi; E. Abeille, Bull. Soc. Ent. Fr. (5) iv. p. ccxxiii. On the habits of *A. salicis* in the department of the Aube; G. d'Antessanty, Feuil. Nat. no. 46, p. 120.

Trachys pumila, Ill.; the type form, and varieties *scrobiculata*, Meg., *phlyctenoides*, Kol., *ahenata*, Muls., and ? *major*, Perr., discussed and characterized; G. Kraatz, B. E. Z. xviii. pp. 129 & 130.

New genera and species :—

Pachypyga, E. Steinheil, Atti Soc. Ital. xv. (1872) p. 564. Allied to *Anthaxia*. *P. undata*, id. *ibid.*, San Luis.

Pseudochrysodema, E. Saunders, Cist. Ent. pt. ix. p. 223. Facies of *Chrysodema*, but with flavous tarsi and strongly angulated shoulders. *P. badeni*, *ibid.*, Yap Island, Carolina group, *schmeltzi*, p. 224, Pelew Islands, *id. l. c.*

Sternocera boucardi, p. 219, Ribé, E. Africa, *syriaca*, p. 220, Syria, *id. l. c.*

Amblysterna bilineata, *id. l. c.* p. 220, Loando.

Julodis mucescens, C. A. Dohrn, S. E. Z. xxxv. p. 256, Palestine.

Catoxantha eburnea, O. E. Janson, Cist. Ent. pt. xi. p. 340, pl. ix. fig. 1 (not issued), Andaman Islands.

Chrysochroa semperi, E. Saunders, Tr. E. Soc. 1874, p. 303, Luzon.

Chrysaspis propinqua, *id. Cist. Ent. pt. ix. p. 221*, W. Coast of Africa.

Steraspis fusca, *id. ibid.*, White Nile.

Iridotenia cupreo-marginata, p. 304, 3-*vittata*, p. 305, *sulcifera*, p. 306, Philippine Isles, *id. Tr. E. Soc. 1874*.

Chrysodema flavicornis [-ne], p. 306, *deyrollii*, p. 307, *dohrni*, *intercostata* [-tum], p. 308, *purpureicollis* [-le], p. 309, *adjuncta* [-tum], *variipennis* [-ne], p. 310, *proxima* [-mum], p. 311, *antennatus* [-tum], p. 313, Philippine Isles, *id. l. c.*

Paracupta æneiventris, locality unknown, *samoensis*, Samoa, *id. Cist. Ent. pt. ix. p. 222*.

Evdes intermedia, *id. l. c. p. 225*, W. Coast of Africa.

Chrysesthes auro-notata, *id. ibid.*, Honduras.

Pelecopselaphus chevrolati and *acutus*, *id. l. c. p. 226*, Nicaragua.

Halecia bicolor, p. 227, Ega, *chrysomeloides*, Chontales, *paralella*, Peru, p. 228, *rugicollis*, Brazil, *costata*, Brazil ?, p. 229, *picticeps*, *batesi*, p. 230, *cupriceps*, p. 231, Amazons, *cyaneo-notata*, p. 231, Para, *belti*, p. 232, Chontales, *igniventris*, p. 233, Brazil, *id. l. c.*

Psiolptera leyboldi, E. Steinheil, Atti Soc. Ital. xv. p. 563, Mendoza.

Dicercomorpha mutabilis, E. Saunders, Tr. E. Soc. 1874, p. 314, Philippine Isles.

Pasiphae amazonica, p. 233, *vitticollis*, p. 234, *id.* Cist. Ent. pt. ix. Amazons.

Pecilonota semperi, *id.* Tr. E. Soc. 1874, p. 315, Luzon.

Melanophila oxyura, Marquet, Bull. Soc. Toulouse, viii. p. 30, S. France.

Anthaxia debilipennis, E. Steinheil, l. c. p. 563, Mendoza.

Dactylozodes leyboldi, *id.* l. c. p. 565, Mendoza.

Stigmodera pubicollis, p. 539, *tibialis*, 7-guttata, p. 540, 5-punctata, confusa, p. 541, atro-notata, p. 542, viridicincta, p. 543, 3-colorata, p. 545 (and varr. of *S. pubicollis* and *limbata*), C. O. Waterhouse, Tr. E. Soc. 1874, W. Australia.

Chrysobothris pictiventris, p. 316, 8-notata, p. 317, philippinensis, ventralis, p. 318, Philippine Isles, E. Saunders, Tr. E. Soc. 1874.

Coræbus celestis, *cisseoides*, p. 319, pullatus, p. 320, melibæiformis, p. 321, Philippine Isles, *id.* l. c.

Cryptodactylus philippinensis, *id.* l. c. p. 321, Luzon.

Toxoscelus rugicollis, *id.* l. c. p. 322, Luzon.

Sambus auricolor, p. 322, Samar, lugubris, p. 323, Bohol, *id.* l. c.

Agilus semperi, p. 324, abdominalis, nigro-cinctus, p. 325, iniquinatus, pilicauda, p. 326, pulcher, vilis, p. 327, Philippine Isles, *id.* l. c.; *A. mendozanus*, E. Steinheil, l. c. p. 565, Mendoza.

Trachys princeps, Luzon, dubia, Bohol, E. Saunders, l. c., p. 328; *T. fragrarie* and *marseuli*, C. Brisout de Barneville, Bull. Soc. Ent. Fr. (5) iv. p. lxx., St. Germain-en-Laye.

THROSCIDÆ.

Trixagus bonvouloiri, sp. n., E. Steinheil, Atti Soc. Ital. xv. p. 566, San Luis.

EUCNEMIDÆ.

Nematodes foveicollis, sp. n., C. G. Thomson, Opusc. Ent. (vi.) p. 550, West Gothland (? = *filum*, Kies.).

ELATERIDÆ.

E. CANDÈZE, Mém. Liège (2) iv. [published after v.], pp. i.-viii., 1-218, has published the first fasciculus of a 'Révision de la Monographie des Elatérides.' The classification of the family in natural sequence is abandoned as impossible, and the author has chiefly altered the system of his older work by elevating the 'sub-tribes' of the latter to the rank of 'tribes,' and suppressing the term 'true Elatérides.' The *Melanactides* are also suppressed and their members re-distributed. The tribes discussed are *Agrypnites*, *Alaites*, *Chalcolepidiites*, and *Oxynopterites*. The following observations occur:—

Agrypnus bocandii, Cand., = *pubescens*, Cand., var.; *A. sondaicus*, C., = *punctatus*, C., var.; *A. funestus* and *gilvus*, C., = *mæstus*, C.; *A.* 1874. [VOL. XI.]

lactor, McLeay, = *mastersi*, McL., of which varr. nn. *duboulayi* and *ereptus* are described, p. 13; *Adelocera lacerta*, C., = *cribrata*, C.; *A. squalida*, Fairm., and *nigro-plagiatus*, Bl., = *modesta*, Boisd.; *A. chapuisi*, C., = *palliatu*, Latr.; *Cryptotarsus*, Philippi, nec Kirsch, is re-named *Apocryptus*, p. 39; *Lacon tumidicollis*, C., = *vestitus*, Kl.; *L. confusus*, C., = *irroratus*, Kl.; *L. maillardi*, Deyr., = *flavipes*, C.; *L. cylindricus*, C., = *truncatus*, Hbst.; *Trachylacon fulvicollis* and *lobicollis*, Mota., are referred to *Agræus*; *Tilotarsus cuspidatus*, C., = *cinctipes*, Germ.; *T. boieldieu*, C., = *cuspidatus*, Kl.; *Pyrophorus*, *Corymbites*, and allies, though some of them would be well placed next the *Alaites*, *Oxynopterites*, &c., are removed, in order to keep the genera with keeled foreheads together; *Calais ophthalmicus*, C., is a *Pyrophorus*, and *Calais* is sunk as a section of *Alaus*; *A. gorgops*, Lec., = *lusciosus*, Hope; *A. naja*, C., = *melanops*, Lec.; *Chalcolepidius æquinotialis*, Cast., = *silbermanni*, Chev.; *Semiotus speciosus*, Er., = *sanguinicollis*, Blanch., ? = *suturalis*, F.; *Beliothorus* is removed from near *Oxynopterus* to the *Dimites*; *Oxyn. mucronatus* and *audoini* are considered distinct; *Leptophyllus latipennis*, Hope, and *Megalorhipis validicornis* and *minor*, C., = *L. strachani*, Hope.

The following new genera and species are characterized:—

Hexaulacus, p. 40. *Agrypnites*, between *Anacantha* and *Ocneus*. Six furrows for reception of the tarsi. *H. reedi*, *ibid.*, Valdivia.

Eumæus, p. 113. *Alaites*, next *Euphemus*, from which it is distinguished by the absence of furrows on the prosternal sutures. Differs from *Alaolacon* in the double pectination of its antennæ in the ♂. *Eum. murrayi*, *ibid.*, Madras.

Agrypnus attenuatus, p. 4, Guinea, *australis*, p. 5, Lake N'Gami, *arabicus*, Arabia, *persicus*, Persia, p. 6, *rufipes*, p. 7, Pondicherry, *opacus*, p. 8, Malacca, *attonitus*, p. 10, India.

Adelocera cæca, p. 18, Guatemala, *oliveri*, p. 20, Darjeeling, *unicolor*, p. 21, Persia, *calabarica*, Old Calabar, *aberrans*, Caraccas, p. 23, *spurca*, p. 25, Laos, *wallacii*, p. 26, Borneo, *setosa*, p. 29, Para, *adspersa*, p. 30, Guatemala.

Dilobotarsus tessellatus, *nebulosus*, p. 32, Brazil, *subsulcatus*, p. 34, Ecuador, *inopinus*, Nicaragua, *eloini*, Central America, *gracilis*, Amazons, p. 35.

Anacantha marmorata, p. 38, Chili.

Optaleus argentatus, p. 42, Ega.

Lacon grisescens, p. 52, *maculosus*, p. 53, *tripartitus*, p. 54, Madagascar, *albitactus*, Old Calabar, *asper*, Guinea, p. 55, *muscerda*, p. 57, Cape of Good Hope, *bidivisus*, p. 58, Old Calabar, *taciturnus*, Laos, *falsarius*, Ceylon, p. 60, *judez*, p. 62, Shanghai, *leucaspis*, p. 63, *fez*, p. 64, Malacca, *consors*, p. 64, Madras, *comptus*, p. 65, Siam, *coctus*, Burmah, *flavescens*, Ceylon, p. 66, *tactus*, Siam, p. 67, *inops*, p. 67, *afflictus*, p. 68, Malacca, Siam, *minusculus*, p. 68, Bombay, *coarctatus*, p. 70, Himalaya, *birmanicus*, p. 71, Burmah, *nepalensis*, p. 72, Nepal, *schwaneri*, Borneo, *liti-giosus*, Malacca, p. 73, *insularis*, *erinaceus*, p. 74, *gracilis*, p. 83, Malay Archipelago, *cinnamomeus*, E. Siberia, *prætermisus*, East India, p. 76, *depressus*, p. 77, Corea, *wallacii*, p. 81, Celebes, *turgescens*, p. 84, Pulo-

Penang, *sparsus*, Java, *laxus*, Mysol, p. 85, *labiosus*, p. 86, *fatuus*, p. 91, *porriginosus*, p. 93, *punctipennis*, p. 99, W. Australia, *ferrugineus*, p. 87, N. W. Australia, *socius*, p. 87, *crassus*, p. 88, *princeps*, p. 89, Cape York, *deboulayi* [dub-], p. 89, Nicol Bay, *parallelus*, p. 90, *variolus*, p. 92, *pleuriticus*, p. 93, *marmoratus*, p. 94, *octavus*, p. 95, *insignitus*, p. 98, Queensland, *marginatus*, p. 91, Clarence River, *sculptus*, p. 95, Paroo and Darling Rivers, *lacrymosus*, p. 96, S. Australia, *cordipennis*, p. 99, Albany, *calamitosus*, p. 100, Oajaca, *truquii*, p. 101, Mexico.

Meristhus insignitus, Ceylon, *apicalis*, Celebes, Timor, p. 103, *minusculus*, p. 104, Borneo.

Agræus cuniculus, Singapore, *feroculus*, Sumatra, p. 105, *mouhoti*, p. 106, Siam.

Pericus rubicundus, p. 107, locality unknown.

Tilotarsus fulvo-sparsus, p. 109, *simplex*, p. 110, Gaboon, *tuberculatus*, p. 109, Benguela.

Alaolacon griseus, p. 114, Bangkok.

Alaus cerberus, Dahomey, *tortrix*, Natal, p. 123, *podargus*, p. 125, Luzon, *lactellus*, p. 130, *maculosus*, p. 131, *caprimulgus*, p. 136, Borneo, *figuratus*, p. 130, Java, Malacca, *elaps*, Laos, Borneo, Java, p. 132, *scops*, *obliquus*, p. 143, *infumatus*, p. 144, New Guinea, *timoriensis*, Timor, p. 137, *rosenbergi*, p. 138, Celebes, *lynceus*, N. India, *nanus*, Java, p. 139, *eryx*, p. 140, Laos, *larvatus*, p. 141, China, *tisiphone*, p. 142, Ceylon, *haje*, p. 143, Cambodia, *angularis*, p. 145, Mysol, *melancholicus*, p. 147, Queensland, *sericeus*, p. 148, *pumilus*, p. 149, Rockhampton, *cristatus*, p. 150, New Hebrides, *plebeius*, p. 152, Cayenne.

Hemirhipus bonvouloiri, p. 154, Cayenne, *perroudi*, p. 155, Brazil.

Tetrigus pexus, p. 157, Dorey.

Chalcolepidius exulatus, p. 161, ? Brazil, *jekeli*, p. 162, ? Columbia or Central America, *aurulentus*, p. 163, S. California, *corpulentus*, p. 164, Bahia, *jansoni*, p. 165, Nicaragua, *fryi*, p. 168, Peru, *boucardi*, p. 169, Peru.

Semiotus jansoni, p. 174, *zonatus*, p. 176, *acutus*, *bispinus*, p. 180, *buckleyi*, p. 183, *scitulus*, p. 186, *diptychus*, p. 188, Ecuador, *fryi*, p. 175, Quito, *chontale* [sia] nus, p. 177, Chontales, *multifidus*, p. 181, *cristatus*, p. 182, *juvenilis*, p. 187, Colombia, *auripilis*, p. 184, Bolivia, *fusiformis*, p. 185, New Granada.

Camposternus mouhoti, p. 191, *apollo*, p. 199, *saundersi*, p. 203, Laos, *æneus*, p. 192, Bengal, *latiusculus*, p. 193, Pulo-Penang, Malacca, *punctatus*, p. 194, Singapore, *igneus*, *plutus*, p. 195, Borneo, *iris*, p. 196, *luctuosus*, p. 199, Madras, *mulleri*, p. 198, Sumatra, *mniszeechi*, Malacca, *sobrinus*, E. Hindostan, p. 201, *argentipilis*, p. 202, Siam, *parallelus*, p. 203, Burmah.

Pectocera messi, p. 207, Canton.

Cardiophorus mimeticus, Horn, = *edwardsi*, H., ♂; *Limoniis cribricollis*, H., = *Melanotus longulus*, Lec. G. H. Horn, Tr. Am. Ent. Soc. v. pp. 22 & 23.

Melanotus sublucens, Ab., is dropped as a species; E. Abeille, Bull. Soc. Ent. Fr. (5) iv. pp. ccxxiv.

The *Pyrophorus* from Cuba referred to in Zool. Rec. x. p. 279, is stated to be *P. plagioththalmus*, Germ.; Desbrochers des Loges, Bull. Soc. Ent. Fr. (5) iv. p. clxxiv. It is *P. noctilucus*, L.; A. Sallé, *tom. cit.* p. clxxv.

Corymbites tessellatus and *holosericeus* and *Elatér sanguineus*. Notes on economy by M. Rupertsberger, Verh. z.-b. Wien, xxiv. (SB.) p. 5.

Heterocrepidius rufus, sp. n., Steinheil, Atti Soc. Ital. xv. p. 566, San Luis.

Monocrepidius heteroderoides, sp. n., *id. l. c.* p. 567, San Luis.

Ischiodontus candezii, sp. n., C. Ritsema, Ent. M. M. x. p. 223, Congo.

Melanotus hidalgoi, sp. n., L. Perez Arcas, An. Soc. Esp. iii. p. 131, pl. i. fig. 5, Spain.

Æolus lateralis, sp. n., Steinheil, *l. c.* p. 567, Rosario.

Heteroderes patagonus, sp. n., *id. l. c.* p. 568, Patagones.

Horistonotus canescens, p. 568, *castaneus*, p. 569, spp. nn., *id. l. c.*, S. Argentine States.

Elatér phelpsi, sp. n., Horn, Tr. Am. Ent. Soc. v. p. 22, California.

Drasterius pictus, sp. n., Steinheil, *l. c.* p. 568, Buenos Ayres.

Cosmesus obtusipennis, sp. n. *id. l. c.* p. 569, Buenos Ayres.

Esthesopus bicolor, Horn, *l. c.* p. 22, Delaware; *E. humeralis*, Steinheil, *l. c.* p. 569, San Luis: spp. nn.

Glyphonyx mimeticus, sp. n., Horn, *l. c.* p. 23, Texas.

Æstodes puncticolis, sp. n., *id. l. c.* p. 24, N. Dakota.

Aplastus angusticollis, *tenuiformis*, *corymbitoides*, p. 25, *molestus*, p. 27, spp. nn., *id. l. c.*, California.

CEBRIONIDÆ.

A. CHEVROLAT, Ann. Soc. Ent. Fr. (5) iv. pp. 9-38, 363-426, 507-540, pl. i., revises this family, from which he eliminates *Physodactylus*. Several varieties are described; *Cebrio confusus*, Fairm., *nec* Lec., is re-named *denominandus*, p. 37; the females are described of *C. dimidiatus*, H. Luc., p. 365, *andalusicus*, Duv., p. 391, *patruelis*, Fairm., p. 397, *melanocephalus*, Germ., p. 410, *numidicus*, Luc., p. 417; *Cebrio femoralis*, Lec., *nec* Chev., is re-named (*Scaptolenus*) *leontii*, p. 510; *Scaptolenus chevrolati*, Guér., figured, pl. i. figs. 3 & 4; *S. femoralis*, Chev., figs. 5 & 6. Three new genera are instituted (no differential characters being given) from ♂ insects only.

Notes on the habits of *Cebrio* in Corsica, especially as to their flying during rain; E. Revelière, Bull. Soc. Ent. Fr. (5) iv. p. cl. *C. gigas*: records of its metamorphoses, H. Lucas, *tom. cit.* p. cxcv. *C. ustulatus*, Dej. Cat.; G. Kraatz, B. E. Z. xviii. p. 138, notes the absence of any identification of this species.

Cebriorhipis, g. n., Chevrolat, *l. c.* p. 525. For *C. siamensis*, Siam, *coronatus*, Malacca, Cochin China, pl. i. fig. 8, p. 527, *elongatus*, p. 528, *pectinicornis*, p. 529, Java, *id. l. c.*, spp. nn.

Leptelytron, g. n., *id. c.* p. 530. For *Cebrio fuscus*, Fab., and *L. gracilistursis*, sp. n., *id. l. c.* p. 532, Cape of Good Hope.

Muscopsis [*Myo.*], g. n., *id. l.* p. 532. *M. minarum*, sp. n., *id. l. c.* p. 533, pl. i. fig. 7, S. Brazil.;

Cebrio carbonarius, p. 25, *anthracinus*, p. 403, *personatus*, p. 419, *puberulus*, p. 422, Spain, *insularis*, p. 26, Monte Lessina, *semiflavus*, Greece, in table, p. 25 (description omitted), *sulcicollis*, p. 30, *xanthognathus*, *basicornis*, p. 31, *tibialis*, p. 32, *semimarginatus*, *fusciventris*, p. 33, *rugicostatus*, p. 34, *pallidipennis*, p. 35, *semistriatus*, p. 36, *boucadensis*, p. 37, *deformis*, pp. 38 & 383, *cincticollis*, p. 365, *rufangulus*, p. 366, *consimilis*, *conformis*, p. 368, *erythrogonus*, p. 369, *poupillieri*, p. 370, *lanuginosus*, *rubro-cinctus*, p. 371, *carinicollis*, p. 374, *divisus*, p. 375, *dipartitus*, p. 376, *juvencus*, p. 377, *picipennis*, p. 378, *cinctiventris*, p. 379, *erythropterus*, p. 380, *constantinensis*, p. 381, *macilentus*, p. 382, *intermedius*, p. 383, *infuscatus*, p. 384, *quadraticollis*, p. 385, *muticus*, p. 386, *coxalis*, p. 393, *obscuripes*, p. 394, *saintpierrei*, p. 395, *aterrimus*, p. 396, *ventralis*, p. 397, *compactilis*, p. 398, *catoxanthus*, p. 400, *levaillanti*, p. 401, *oranensis*, p. 402, *atriceps*, p. 407, *ernesti*, p. 408, *laticornis*, p. 409, *annulicornis*, p. 410, *transversalis*, p. 411, *atricapillus*, p. 412, *humerosus*, *comptus*, p. 413, *geminus*, p. 415, *pachycephalus*, p. 416, *geniculatus*, p. 417, *pectoralis*, p. 538, Algeria, *latericollis*, p. 382, locality unknown, *segmentatus* and var. *cinnabaripennis*, pp. 390 & 391, Mogador, *impressicollis*, Spain, *antennatus*, Greece, p. 392, *marocanus*, p. 418, Tangiers; Chevrolat, *l. c.*, spp. nn.

Scaptolenus fulvus, p. 510, *gibbus*, p. 511, *vagans*, 512, pl. i. figs. 1 & 2, *revestitus*, p. 513, *sulcipennis*, *villosus*, p. 514, *amplipennis*, p. 515, *signaticollis*, p. 518, *subapicalis*, p. 519, *obscuriceps*, p. 520, *pueblæ*, p. 521, *ruficornis*, p. 522, *guttiventris*, p. 525, Mexico, *rubriventris*, p. 520, Costa Rica, *candezii*, p. 521, Guatemala, *mouffleti*, Vera Cruz, *gehini*, N. America, p. 523, *californicus*, p. 524, California, *id. l. c.*; *S. estriatus*, J. L. Leconte, Tr. Am. Ent. Soc. v. p. 55, Texas: spp. nn.

Anachilus mandibularis, sp. n., Chevrolat, *l. c.* p. 537, Florida.

RHIPIDOCERIDÆ.

Brachyspectra, g. n., J. L. Leconte, Tr. Am. Ent. Soc. v. p. 55. General facies of *Zenoa*, but broader, with the mouth more inflexed, and mandibles smaller; no onychium; trochantin of front coxæ indistinct; prosternum prolonged behind coxæ, and received in an excavation of the mesosternum. Can only be referred, however, to this family, unless it be one of the *Eubriini*. *B. fulva*, sp. n., *id. l. c.* p. 56, Texas.

DASCILLIDÆ.

Helodes flavicollis, Kies., common in Japan, where *Cyphon* (?) *variabilis* occurs; H. v. Kiesenwetter, B. E. Z. xviii. p. 245.

Helodes marginata and *Cyphon* (*variabilis* ?). Larvæ described, especially as to internal anatomy, and figured; W. Rolph, Arch. f. Nat. xl. pp. 25–35, pl. i. figs. 24–40.

Hydrocyphon deflexicollis. Its sub-aquatic transformations noted; C. Bloesch, Pet. Nouv. vi. p. 399; H. Tournier, *tom. cit.* p. 413.

Aræopus [Spinola, *Hemiptera*], g. n., J. L. Leconte, Tr. Am. Ent. Soc. v. p. 56. Referable to the *Eucnemidæ*, if it were not for the unprotected frontal insertion of its antennæ, and transverse, prominent, front coxæ, with large trochantin. Allied to *Lichas* and *Stenocolus*. *A. monachus*, sp. n., *id. l. c.* p. 57, Oregon.

Eubrianax, g. n., H. v. Kiesenwetter, B. E. Z. xviii. p. 246. Joins the *Dascillidæ* and *Lampyrides*, but with the abdominal segments of the *Eubriidæ*. *E. ramicornis*, sp. n., *id. l. c.* p. 247, Japan.

Grammeubria, g. n., *id. l. c.* p. 248. Differs from the true *Eubriidæ* in its maxillary palpi being acuminate at the apex, not spinose. *G. opaca* and *nitidula*, spp. nn., *id. l. c.* p. 249, Japan.

Odontonyx pectinata, sp. n., Kiesenwetter, *l. c.* p. 242, Japan.

Octoglossa flabellata, sp. n., *id. ibid.*, Japan.

Dicranopselaphus edwardsi, sp. n., Leconte, *l. c.* p. 57, California.

Cyphon puncticeps, sp. n., Kiesenwetter, *l. c.* p. 245, Japan.

Microcara dispar, sp. n., Seidlitz, Fauna Baltica, p. 329, note, Spain.

Prionocyphon ovalis, p. 243, *fuscipennis*, p. 244, spp. nn., Kiesenwetter, *l. c.* Japan.

Scirtes japonicus, sp. n., *id. l. c.* p. 244, Japan.

Ptilodactyla pallida, sp. n., E. Steinheil, Atti Soc. Ital. xv. p. 569, Buenos Ayres.

TELEPHORIDÆ.

H. v. Kiesenwetter, B. E. Z. xviii. pp. 241–288, describes the species of Malacoderms found by G. Lewis in Japan. These are of the Eastern Siberian type for the most part.

Lycides.

Lycus modestus, sp. n., *id. l. c.* p. 250, Japan.

Celetes pectinifer, p. 251, *quadricollis*, p. 252, spp. nn., *id. l. c.* Japan.

Eros militans, p. 253, *delicatulus*, *spinicoxis*, p. 254, *nasutus*, p. 255, *geometricus*, p. 256, *coracinus*, p. 257, *nothus*, p. 258, spp. nn., *id. l. c.* Japan.

Lampyrides.

Lampyris, ♂ luminous; G. de Tromelin, Bull. Soc. Ent. Fr. (5) iv. pp. cxxxvii., clxxxiv. & exciv. Other observations, especially as to *L. mauritanica*, and the scintillating effect produced by rapid extinction of light; *tom. cit.* pp. cxlviii. & clxi. General account; E. Halse, Sci. Goss. 1874, pp. 85–88.

Matheteus, g. n., J. L. Leconte, Tr. Am. Ent. Soc. v. p. 58. Probably near *Calypsocephalus*, but with widely distant antennæ, broader mouth and better developed labrum. *M. theveneti*, sp. n., *id. l. c.* p. 59, California.

Lucernuta discicollis, sp. n., H. v. Kiesenwetter, B. E. Z. xviii. p. 258, Japan.

Lucidota tabida, p. 259, *vulnerata*, p. 260, *angusticollis*, p. 261, spp. nn., *id. l. c.*, Japan.

Luciola vitticollis, p. 261, *picticollis*, p. 262, *parvula*, *præusta*, p. 263, spp. nn., *id. l. c.*, Japan.

Microphotus angustus, sp. n., J. L. Leconte, Tr. Am. Ent. Soc. v. p. 58, Oregon, California.

Drilides.

Drilonius, g. n., H. v. Kiesenwetter, *l. c.* p. 282. Differs from *Drilus* in its punctate-striate elytra, the punctures being separated by transverse elevated lines; abdomen with 6 segments. *D. striatulus*, sp. n., *id. ibid.*, Japan.

Telephorides.

Mastinocerus. J. L. Leconte, *l. c.* p. 60, after an examination of the type in the Paris Museum, sees "no reason for separating this as a distinct genus" [presumably, though not so stated, from *Phengodes*]. Solier's insect has the last joint of the antennæ broken, and the 10th joint, taken for the last, is described as bifurcated!

Telephorus paulinoi, Kies., re-described and figured; L. Perez Arcas, An. Soc. Esp. iii. p. 134, pl. ii. fig. 4.

Phengodes integripennis, sp. n., Leconte, *l. c.* p. 59, California.

Mastinocerus texanus, sp. n., *id. ibid.*, Texas.

Chauliognathus (tabulated) *lewisi*, sp. n., G. R. Crotch, Tr. Am. Ent. Soc. v. p. 78, New Mexico.

Podabrus macilentus, p. 264, *ochraceus*, *malthinoides*, p. 265, spp. nn., H. v. Kiesenwetter, B. E. Z. xviii. Japan.

Cantharis japonica, p. 266, *ciusiana* [? *kiushiuana*], p. 267, *œdemeroides*, p. 268, *provida*, *episcopalpis*, p. 269, *midas*, p. 270, *viridipennis*, *venatrix*, p. 271, *attristata*, p. 272, *luteipennis*, *curtata*, p. 273, *adusticollis*, p. 274, *ciusiana* [again!], *ægrotæ*, p. 275, *modesta*, p. 276, *vitellina*, p. 277, *badia*, *plebeia*, p. 278, spp. nn., *id. l. c.*, Japan.

Telephorus oriflavus, J. L. Leconte, P. Bost. Soc. xvi. p. 273, White Mountains; *T. flavigena*, E. Steinheil, Atti Soc. Ital. xv. p. 570, Rosario: spp. nn.

Silis spinigera, *cava*, *vulnerata*, Oregon, p. 61, *flavida*, p. 61, *filigera*, p. 62, California, spp. nn., Leconte, Tr. Am. Ent. Soc. v.

Ditemnus obtusus, sp. n., *id. l. c.* p. 62, California.

Malthinides.

Ichthyurus discoidalis, West.; J. O. Westwood, Thesaurus ent. oxon., p. 102, pl. ii. fig. 2.

Malthodes. H. v. Kiesenwetter, B. E. Z. xviii. pp. 45-70, completes his revision of the European species [Zool. Rec. ix. p. 274]. The plates referred to are in B. E. Z. xvi. 81 species in all are described, and a table is given, dividing them by the abdominal appendages.

Malthinellus, g. n., *id. l. c.* p. 280. Tibiæ distinctly spurred; differs from *Malthinus* in its antennæ being nearer the inner margin of the eyes, and from *Malchinus* and *Malthodes* in its more strongly punctate-striate elytra. *M. bicolor*, sp. n., *id. l. c.* p. 281, Japan.

Trypherus argentinus, sp. n., E. Steinheil, Atti Soc. Ital. xv. p. 571, Rosario.

Podistra japonica, sp. n., Kiesenwetter, l. c. p. 279, Japan.

Malthinus humeralis, sp. n., id. l. c. p. 280, Japan.

Malthodes niponicus, sp. n., id. l. c. p. 281, Japan.

Malachiides.

Cephaloncus capito, Westw.; J. O. Westwood, Thesaurus ent. oxon., p. 102, pl. v. fig. 6.

Malachius bipustulatus (?) in Japan; H. v. Kiesenwetter, B. E. Z. xviii. p. 284.

Malachius laticollis, Baudi, = *heteromorphus*, Ab.; *Anthocomus fenestratus*, Lind., = *regalis*, Charp.; E. Abeille, Bull. Soc. Ent. Fr. (5) iv. p. ccxxiv.

Malachius abeillii, Bauduer, Bull. Soc. Ent. Fr. (5) iv. p. clxiv., Jaffa; *M. macer*, *spinipennis*, p. 27, *theveneti*, p. 28, G. H. Horn, Tr. Am. Ent. Soc. v. California; *M. xantholoma*, *foveifrons*, p. 284, *vitticollis*, p. 285, Kiesenwetter, l. c., Japan: spp. nn.

Laius flavicornis and *histrion*, spp. nn., Kiesenwetter, l. c. p. 283, Japan.

Attalus japonicus, sp. n., id. l. c. p. 286, Japan.

Ebæus chlorizans, p. 286, *picticollis*, p. 287, spp. nn., id. l. c., Japan.

Hypebæus oblongulus, sp. n., id. l. c. p. 287, Japan.

Carphurus plagiatus, sp. n., id. *ibid.*, Japan.

Dasytides.

Henricopus perezi, Kies., figured, and its affinities discussed; L. Perez Arcas, An. Soc. Esp. iii. p. 134, pl. i. fig. 6.

Lobonyx ruficollis, Raffray, = *gracilis*, Reitt.; E. Reitter, Verh. z.-b. Wien, xxiv. p. 528.

Haplocnemus koziorowiczii, Desbr.; Desbrochers, while admitting that *H. marginatus*, Rott., may be identical with *rufimarginatus*, Perr., objects to his own species being also referred to the latter; Bull. Ent. Ital. vi. p. 225. E. Ragusa, *op. cit.* p. 313, adheres to the opinion that Desbrochers' insect is conspecific with Perris'.

Dasytes japonicus, sp. n., H. v. Kiesenwetter, B. E. Z. xviii. p. 288, Japan.

Astylus strobili, sp. n., E. Steinheil, Atti Soc. Ital. xv. p. 572, Mendoza, Salvador.

Arthrobrachys testaceus, 4-lineatus, *depressus*, p. 572, *testaceo-limbatus*, p. 573, spp. nn., id. l. c., S. Argentine States.

CLERIDÆ.

A. CHEVROLAT, R. Z. (3) ii. pp. 252-329, catalogues the species in his collection, with synonymic rectifications. *Dupontiella*, Spin., belongs to the *Trogositidæ*; *Opilo germanus*, Chev., = *pallidus*, var. [= *mollis*, var.]; *Trichodes subapicalis*, Chev., = *affinis*, var.

The following genus and species are characterized as new:—

Sallea[-*lea*], p. 286. Form of a large *Necrobia*; to come near *Chariessa*.

Type, *Serriger coffini*, White, and *Sallœa necrobioides*, Guatemala, *rubripennis*, and (*S. ?*) *bicolor*, Mexico, p. 287.

Cylidrus pallipes, p. 280, E. India.

Macrotelus ? cinctipennis, p. 281, Cuba.

Cladiscus hindostanus, p. 281, Sylhet.

Tillus leucomelas, p. 281, Mexico.

Pallenis fulvescens (? Mots.), p. 282, E. India.

Cymatodera melazona, New Granada, *geniculata*, Guatemala, p. 282.

Priocera hypocrita, Brazil, *flavo-guttata*, Yucatan, p. 283.

Azina retrocincta, p. 283, Natal.

Opilo nigrites, Africa (*O. ?*), *tuberculicollis*, Natal, p. 284, *O. varipes*, Sydney, *præustus*, N'Gami, p. 285, *punctipennis*, p. 286, Chili.

Deresstenus distinctus, Yucatan, *nigrifrons*, *lateralis*, *mutabilis* (and 3 varr.), p. 289, *vittipennis*, p. 290, Mexico.

Thanasimus melanocephalus, p. 290, Nova Scotia.

Clerus obliquivittis, p. 291, *morosus*, p. 296, Brazil, *mutabilis*, p. 291, *semiochraceus*, p. 292, *4-nodosus*, p. 293, *sanguinipes*, p. 295, *scutellaris*, p. 296, *mollifascia*, p. 297, Mexico, *indagator*, p. 292, Venezuela, *paraensis*, p. 293, *faber*, p. 294, *3-cinctus*, p. 295, *cognatus*, p. 296, Pará, *meridanus*, p. 293, *pilatii*, p. 295, Yucatan, *torquatus*, Guiana, *simulans*, Cayenne, p. 294, *immarginatus*, p. 297, New Granada, *scapularis*, p. 298, Natal.

Aulicus plutus, p. 298, *chrysurus*, p. 299, Australia, *corallipes*, p. 298, Tasmania, *basicollis*, *albo-guttulatus*, p. 289, *bilineatus*, p. 300, Cuba.

Olesterus cruentatus, p. 300, Australia.

Zenithicola funestus, p. 300, *sosius*, p. 301, Australia.

Trichodes dregii, p. 301, Cape of Good Hope, *rufitarsis*, p. 302, *caucasicus*, p. 305, Caucasus, *sinae*, p. 303, N. China, *gulo*, p. 304, Corfu, *6-pustulatus*, Syria (? = *affinis*, var.), *georgianus*, Asiatic Georgia, p. 306, *ephippiger*, Erzeroum, *kindermanni*, Asia Minor, p. 307, *atticus*, p. 308, Greece, *x-littera*, p. 309, Algeria.

Eteale speculum, p. 309, *herbacea*, *albo-scutellata*, p. 310, *semichrysea*, (*E. ?*), *anormis*, p. 311, (*E. ?*) *brevicornis*, *lanata*, p. 312, (*E. ?*) *laticincta* and *disparipes*, p. 313, Australia, *tasmaniae*, p. 310, Tasmania.

Stigmatium thanasimoides, p. 313, *basipes*, p. 314, Malacca, *dimidiatum*, Cochin China, *nitidiceps*, Dorey, p. 314, *leucochile*, p. 315, Siam, *basipenne*, p. 315, *pallipes*, p. 317, Borneo, *fasciiventre*, *flascens*, *linea-alba*, p. 316, *miserum*, p. 317, Australia.

Omadius semicarinatus, p. 317, *annulipes*, p. 318, Molucca, *nigro-punctatus*, p. 318, Cambodia, *pictipes*, *novæguineensis*, p. 319, New Guinea.

Epiphlaeus marginipes, Mexico, *lividipes*, Venezuela, *4-stigma*, Cuba, p. 320.

Lemidia xanthozona, Australia, *pulverosa*, E. India, *semilutea*, N. India, p. 321.

Hydnocera funebris, p. 321, California, *bituberculata*, *nitidicollis*, Mexico, *4-lineata*, Yucatan, p. 322.

Eurymetopum circumflexum, p. 323, Chili.

Tenerus binotatus, p. 323, Malaisia.

Ichenea religiosa, p. 323, *3-lineata*, *circumcincta*, p. 324, Mexico.

Platynoptera ichnoides, p. 325, Mexico.

Pelonium militare, p. 324, *stenochioides*, p. 325, *nigriclavatum*, p. 326,

bilineicolle, p. 327, Mexico, *pennsylvanicum*, p. 325, Pennsylvania, *pici-ventre*, p. 325, Cuba, *insigne*, no locality known, *lineaticolle* and *filiolus*, California, p. 326, *subfasciatum*, p. 327, Guadalupe, *flavo-marginatum*, p. 327, *circumcinctum*, p. 328, Brazil, *4-notatum*, p. 328, Texas.

Orthopleura suturalis, p. 328, Mexico.

Trichodes alvearius plunging its mandibles into the abdomen of a Hymenopterous insect; J. de Gaulle, Feuille. Nat. no. 46, p. 124.

Corynetes rufipes. Injurious to hams in N. America; transformations described and figured. C. V. Riley, Rep. Ins. Mo. vi. pp. 96-102, fig. 96.

Trichodes bimaculatus, sp. n., J. L. Leconte, Tr. Am. Ent. Soc. v. p. 63, California, Oregon (? = *nuttalli*, Kby., var.)

Hydnocera bonariensis, sp. n., E. Steinheil, Atti Soc. Ital. xv. p. 573, Buenos Aires.

Lebasiella maculicollis, sp. n., Leconte, l. c., California.

Necrobia fusca, sp. n., Steinheil, l. c. p. 573, San Luis.

CUPESIDÆ.

Priacma, g. n., J. L. Leconte, Tr. Am. Ent. Soc. v. p. 87. Differs from *Cupes* in its antennæ being less approximate at the base, shorter and stouter, eyes smaller, under surface of head quite different, &c. Type, *Cupes serrata*, Lec.

Cupes lobiceps, sp. n., id. l. c. p. 88, California.

PTINIDÆ.

Diplocotes howittanus, Westw., fig. 6, *Polyplocotes longicollis*, W., fig. 4, and *nitidus*, W., fig. 5, p. 103, *Ectrephes formicarum*, Pasc., fig. 1, *pascoii*, W., fig. 3, *kingi*, W., fig. 2, p. 104, re-described and figured; J. O. Westwood, Thesaurus ent. oxon., pl. iii.

Dryophilus rugicollis, ♂, only differs from ♀ in having a small spine at apex of 4 anterior tibiæ. C. Brisout, Bull. Soc. Ent. Fr. (5) iv. p. lxxvi.

Niptus hololeucus eating paper, at St. Petersburg; Morawitz, Bull. Ent. Ross. x. p. xi. Eating tea, at Shanghai; J. F. M. H. Stone, P. E. Soc. 1874, p. xxvii.

Vrilletta, g. n., J. L. Leconte, l. c. p. 64. Allied to *Xyletinus*, from which it differs conspicuously in its antennæ. *V. murrayi*, *expansa*, *ibid.*, *convexa*, p. 65, spp. nn., California.

Eucratocerus, g. n., id. l. c. p. 65. Closely allied to *Ptilinus*, differing in the form of the antennæ, the larger and less prominent eyes, and longer and more slender tarsi. *E. horni*, sp. n., id. *ibid.*, Texas.

Hedobia granosa, sp. n., id. l. c. p. 63, California.

Xestobium affine, p. 63, Vancouver Island, California, *squalidum*, p. 64, Rhode Island, spp. nn., id. l. c.

Dorcatoma pallicornis, id. P. Bost. Soc. xvi. p. 274, Mt. Washington; *D. argentina* (? = *rufipes*, Boh.), E. Steinheil, Atti Soc. Ital. xv. p. 574, Buenos Ayres: spp. nn.

BOSTRYCHIDÆ.

Sinozylum sp., severing stems of trees in British Burmah; P. E. Soc. 1874, p. xii.

Apate hamaticollis, sp. n., L. Fairmaire, Pet. Nouv. vi. p. 407, Algerian Sahara.

Bostrychus angustus, sp. n., E. Steinheil, l. c. p. 575, Buenos Ayres.

Polycaon plicatus, p. 65, *obliquus*, p. 66, spp. nn., J. L. Leconte, Tr. Am. Ent. Soc. v., Texas.

LYCTIDÆ.

Lyctus. European species tabulated; H. Tournier, Pet. Nouv. vi. pp. 411 & 412.

Lyctus deyrollei, p. 411, Mingrelia, *caucasicus*, p. 412, Caucasus, spp. nn., id. l. c.

CICIDÆ.

Cis sublineatus, Wank., = *fuscicornis*, Mell.; *C. striatulus*, Mell., = *flavipes*, Luc., but stands, on account of the prior *flavipes*, Mots.; *C. fuscatus*, Mell., = *castaneus*, Mell., var.; E. Abeille, Bull. Soc. Ent. Fr. (5) iv. p. ccxxiv. *C. alni*, Mellé, nec Gyl., is re-named *coluber*, id. l. c. p. lii.

Rhopalodontus baudueri, sp. n., id. l. c. p. lii. Sos.

Cis striato-punctatus, p. 574, *bonariensis*, *biramosus*, p. 575, E. Steinheil, Atti Soc. Ital. xv., Buenos Ayres; *C. reflexicollis*, Pyrenees, p. lii., *perrisi* and *filum* (an *Ennearthron*, p. ccxxiv.), Sos, *4-dentulus*, Landes, p. liii., Abeille, l. c.: spp. nn.

TENEBRIONIDÆ.

F. BAUDI, Bull. Ent. Ital. vi. pp. 183-200, 275-301, commences an enumeration (with notes as to localities, &c.) and revision of the species existing in Italian collections. The present portion includes from the *Zophosides* to the *Akisides*. Some new species are named, and their localities mentioned, the descriptions being stated to be published in B. E. Z. 1875. 7 species (*Tentyriides*, *Stenosides*) are however sufficiently characterized in the present work for quotation.

Tentyriides.

Craniotus removed from the *Gnathosiini*, and stated to form a distinct tribe nearer the *Epiphysini*, principally on account of its broad metasternal episterna. *Auchmobius* possibly also represents another tribe, on account of the form of its antennæ and the feeble mandibular grooves. The remaining genera tabulated. G. H. Horn, Tr. Am. Ent. Soc. v. pp. 29 & 30. *Cryptadius*, Lec. (re-characterized) = *Eurymetopon*; id. l. c. p. 33.

Stibia ovipennis, p. 28, California, *hispidula*, p. 29, Utah, spp. nn., id. l. c.

Gnathosia pumila, sp. n., F. Baudi, Bull. Ent. Ital. vi. p. 197, Greece.

Microdera marginata, sp. n., *id. l. c.* p. 278, S. Persia.

Epitragides.

Chilometopon, g. n., G. H. Horn, *l. c.* p. 31. Distinguished (as to American genera only) from *Schenicus* by its tarsal clothing and superciliary ridge. *Trimytis abnormis*, Lec., and *C. helopioides*, sp. n., *id. ibid.* California.

Epitragus gigas, *scabripennis*, *mariae*, p. 576, *elegans*, *similis*, *difficilis*, p. 577, *mollis*, *minutus*, p. 578, spp. nn., E. Steinheil, Atti Soc. Ital. xv. S. Argentine States.

Stenosides.

Stenosis tenuicornis, sp. n., Baudi, *l. c.* p. 295, S. Persia.

Dichillus palestinus, p. 296, Palestine, *cylindricus*, Asia Minor, (*D. ?*) *rugatus*, N. Persia, p. 298, (*D. ?*) *bicarinatus*, p. 299, Algeria, spp. nn., *id. l. c.*

Scaurides.

Schizillus, g. n., G. H. Horn, Tr. Am. Ent. Soc. v. p. 33. Allied to *Centrioptera*, differing in its much broader genæ and completely divided eyes. *L. laticeps*, sp. n., *id. ibid.* California.

Blaptides.

Eleodes texana, Lec., = *suturalis*, Say, var.; *id. l. c.* p. 34.

Eleodes retorator, sp. n., *id. l. c.* p. 33, Texas.

Asidides.

Asida. The real and reputed German and Swiss species noticed by G. Kraatz; B. E. Z. xviii. pp. 105–112. There is only one of the former, *A. sabulosa*, Goeze (*rugosa*, Fourcroy, All.; *grisea*, Ol., *nec* F.; *vicina*, Sol., to which *duftschmidtii*, Gemm., *morbillosa* and *variolora*, F., *helvetica*, Sol., *glabricosta*, Sol., *insidiosa*, Muls., and ? *obesa*, All., are referred as varr.). *A. longicollis*, Sol., = *grisea*, F. *A. paulinoi*, Perez, = *pygmæa*, Rossi; *id. l. c.* p. 113 (this is not so: the insect differs from *pygmæa*, Rossi, *nec* Allard, and is nearer *marginicollis*, Rossi; L. Perez Arcas, Act. Soc. Esp. iii. p. 96). Observations on typical specimens of *A. sabulosa*, *dejeani*, and *terricola*, Küst.: Kraatz, *l. c.* p. 115.

Asida ludovici, p. 136, fig. 1, Ivica, *setosa*, p. 139, fig. 2, Spain, L. Perez Arcas, An. Soc. Esp. iii. pl. iii.; *A. serripes*, A. Chevrolat, *tom. cit.* p. 157, Andalusia; *A. pusillima*, G. Kraatz, *l. c.* p. 112, Sierra Nevada; spp. nn.

Pimeliides.

Pimelia semihispida, sp. n., L. Fairmaire, Pet. Nouv. vi. p. 407, Algerian Sahara.

Molyrides.

Sepidium and *Vieta*: the known species re-characterized, and some described as new; *S. bicornis*, Sol., = *uncinatum*, Er., var.; *S. douei*, Sol.,

= *aliferum*, Er.; *S. gæncæi*, Sol., = *siculum*, Sol., var.; *S. servillii*, Sol., = *barbarum*, Sol.; *S. barthælemii*, Sol., ♂, *maillii*, Sol., ♀, = *tomentosum*, Er.; *S. cerisii* and *flexuosum*, Sol., = *2-cuspidatum*, F., varr.; a var. *confusum* is described of *S. wagneri*, Er., from Tlemcen, p. 141; *Vieta vestita*, Sol., = *senegalensis*, Kl.; *V. dufossæi*, Sol., = *dongolensis*, Cast. E. Allard, R. Z. (3) ii. pp. 120-151.

Echinotus natalensis, sp. n., A. Chevrolat, *tom. cit.* p. 331, Natal.

Sepidium perforatum, p. 130, fig. 1, Tangiers, *reichii*, p. 131, fig. 2, Algeria, Egypt, *laterale*, p. 133, fig. 3, *pallens*, p. 137, fig. 4, Algeria, E. Allard, *l. c.* pl. v., spp. nn.

Vieta algeriana, p. 146, fig. 6, Algeria, *costata*, fig. 7, *ovalis*, fig. 8, p. 149, Abyssinia, *luzori*, p. 150, fig. 9, Egypt, *id. l. c.* pl. v. spp. nn.

Pedinides.

Blapstinus latifrons, sp. n., J. L. Leconte, Tr. Am. Ent. Soc. v. p. 70, Vancouver Island.

Hopatrides.

Platydemia subplumbeum, Fairm., is a *Halonomus*, and ? = *Hadrus europæus*, Mots. (with which *Hopatum sculpturatum* has no connection); L. Fairmaire, Pet. Nouv. vi. p. 389.

Pseudolamus, g. n., *id. l. c.* p. 388. Form of *Gonocephalum*, but last joint of maxillary palpi truncate-oval, labrum entire, eyes small, front tibiae neither dentate nor dilated, &c. *P. seriatoporus*, sp. n., *id. ibid.* Tangiers.

Cnemeplatia rufa, sp. n., H. Tournier, CR. Ent. Belg. 1874, p. lxxxvi. Tangiers.

Diaperides.

Scaphodema pictum, sp. n., G. H. Horn, Tr. Am. Ent. Soc. v. p. 36, Oregon.

Ulomides.

European localities for *U. cyprea*, Ktz., *perroudi*, Muls., and *castanea*, Dahl; L. v. Heyden, B. E. Z. xviii. p. 352.

Phthora americana, sp. n., G. H. Horn, *l. c.* p. 35, Oregon.

Toxicum 3-cornutum, sp. n., C. O. Waterhouse, Ent. M. M. xi. p. 126, Japan.

Cœlometopides.

Hypaulax. Further observations on the recorded species; var. n. *acutangulata*, from N. S. Wales, of *H. orcus*, Pasc. (p. 21); *H. ovalis*, F. B., = *oblonga*, F. B.; F. Bates, Ann. N. H. (4) xiii. pp. 16-23.

Astathmetus, g. n., *id. l. c.* p. 23. With both cheek- and throat-furrows. Distinguished from *Hypaulax* and *Chileone* by its elongate-ovate and less convex form, square prothorax, and want of a thickened margin to the base of the elytra. *A. alienus*, sp. n., *id. l. c.* p. 24, Colombia.

Hypaulax opacula, p. 18, Rockhampton, *ampliata*, p. 19, W. Australia,

and var. *parrii*, p. 20, *tenuistriata*, p. 21, Queensland and N. S. Wales ;
id. l. c. spp. nn.

Tenebrionides.

Iphthimus serratus, Mann., var. from California ; *Scotobæus paral-
 lelus*, Lec., ♂ described ; G. H. Horn, Tr. Am. Ent. Soc. v. p. 35.

Nyctobates subnitens, sp. n., *id. l. c.* p. 35, Arizona.

Tenebrio fuliginosus, sp. n., L. Fairmaire, Pet. Nouv. vi. p. 388,
 Morocco.

Cyphaleides.

Cyphaleus mastersi, Pasc., = *chalybeipennis*, W. McL., which is a *Pro-
 phanes*, as also is *C. cupricollis*, W. McL. ; C. O. Waterhouse, Tr. E. Soc.
 1874, pp. 546 & 547.

Cyphaleus 4-spinosus, sp. n., *id. l. c.* p. 545, Queensland.

Prophanes spinosus, sp. n., *id. l. c.* p. 546, Australia.

Platyphanes oblongus, sp. n., *id. l. c.* p. 547, Australia.

Onodalonides.

Titæna, Er., re-characterized, p. 102, var. n. ? *vivida*, from Melbourne,
 of *T. columbina*, Er. (p. 103), and var. n. *ruficollis*, from W. Australia, of
T. alcyonea, Er. (p. 104), described. F. Bates, Ann. N. H. (4) xiii.

Artystona, g. n., *id. l. c.* p. 104. Differs from *Titæna* in its pro-
 sternum being less strongly and abruptly elevated between the coxæ, and
 not concave in front, and its head less deeply imbedded and not repos-
 ing on the front coxæ. *Titæna interrupta*, Redt., = *erichsoni*, White,
 and *A. wakefieldi* and *rugiceps*, spp. nn., Bates, *l. c.* p. 105, New Zealand.

Callismilax, g. n., *id. l. c.* p. 105. Differs from *Titæna* in the pro-
 sternum being vertical and widely concave in front, wider between the
 coxæ, &c. *Strongylium æneum* and *mulsanti*, Montr., and *C. venusta*,
 p. 106, *mæklini*, p. 107, *deplanckii*, p. 108, *ruficornis*, *grandis*, p. 109,
sternalis, p. 110, *id. l. c.*, New Caledonia : spp. nn.

Titæna pulchra, sp. n., *id. l. c.*, p. 103, N. S. Wales.

Helopides.

Pterogenius neitneri, Cand. ; description reproduced, and figured in
 detail ; J. O. Westwood, Thesaurus ent. oxon., p. 105, pl. v. fig. 2.

Amarosoma simulans, Redt., = *Pheloneis harpaloides*, White ; and,
Pheloneis not being distinct from *Adelium*, the species (*nec* Boisd.) is
 re-named *amaroides*. It is wrongly placed in *Pseudohelops* by Gem-
 minger and Von Harold, who also wrongly sink *Coripera*, Pasc., under
 that genus. F. Bates, Ann. N. H. (4) xiii. p. 112.

Adelium zelandicum, sp. n., *id. l. c.* p. 110, New Zealand.

Helops arizonensis, sp. n., G. H. Horn, Tr. Am. Ent. Soc. v. p. 36,
 Arizona.

Amarygmides.

Eupezus nigerrimus, sp. n., J. G. Wood, "Insects Abroad," p. 183,
 fig. 85, S. Africa.

Amarygmus zelandicus, sp. n., F. Bates, *l. c.* p. 112, New Zealand.

Strongyliides.

Strongylium tenuicolle, Say. A larva, dubiously referred to this species, described and figured from oak, living in company with *Eupsalis minuta* (*Brenthidæ*). O. V. Riley, Rep. Ins. Mo. vi. pp. 117 & 118, fig. 32.

CISTELIDÆ.

Homophilus fallaciosus, Rott., is quite distinct from *longicornis*, Bertol., *ex typ.*; A. v. Rottenberg, B. E. Z. xviii. p. 331.

OTHNIIDÆ.

Polypri[on]a, g. n., A. Chevrolat, R. Z. (3) ii. p. 330. Near *Deres-tenus*. *P. cruz-rufa*, sp. n., *id. ibid.*, Mexico.

Othnius mexicanus, sp. n., *id. ibid.*, Mexico.

PYTHIDÆ.

Salpingides. An account of the European species, by Abeille de Perrin, Bull. Soc. Toulouse, viii., is analyzed in Nouv. et faits, No. 49, pp. cxcviii. & cxcix. *Agnathus*, *Pytho*, *Lissodema* (3 spp.), *Salpingus*, (8 spp.), and *Rhinosimus* (6 spp.) are included in the group, and the following described as new, p. 24:—*Salpingus reyi*, Sos, *Rhinosimus tapirus*, Tarbes, *R. ornithorhynchus*, Var.

MELANDRYIDÆ.

Serropalpus striatus eating through a leaden gas-pipe; Allard, Feuil. Nat., No. 43, p. 88.

Abdera 3-guttata, Gyl., in Scotland; G. C. Champion, Ent. M. M. xi. p. 63.

Scotochroa, g. n., J. L. Leconte, B. Bost. Soc. xvi. p. 274. Allied to *Carebara* and *Spilotus*, having the middle coxæ not contiguous, the maxillary palpi with 2nd and 3rd joints not dilated, and the pubescence short and prostrate: it differs from the former in its smaller head, slender antennæ, and the triangular, less securiform last joint of its maxillary palpi. *S. atra*, *ibid.*, White Mountains, *basalis*, p. 275, Oregon, *id. l. c.*, spp. nn.

Orchesia blandula, sp. n., K. Brancsik, B. E. Z. xviii. p. 229, Carpathian Mountains.

Eustrophus impressicollis, sp. n., J. L. Leconte, Tr. Am. Ent. Soc. v. p. 69, Vancouver Island.

PEDILIDÆ.

Corphyra. Variations in the penis-sheath and other male characters noted; the antennæ are pectinate in one species, and in another the hind tibiæ are grooved as in the front tibiæ of the Lamioïd *Cerambycides*. G. H. Horn, Tr. Am. Ent. Soc. v. pp. 39–42.

Xylophilus patricius, Ab., re-characterized; *X. pygmaeus* and *oculatus*, Gyll., differentiated; E. Abeille, Bull. Soc. Ent. Fr. (5) iv. pp. cccxiv. & cccxv.

Corphyra abnormis, p. 40, *crotchii*, *monticola*, p. 41, *inconspicua*, *bairdi*, *distinguenda*, p. 42, spp. nn., Horn, l. c., California.

Stereopalpus pruinosis, sp. n., J. L. Leconte, Tr. Am. Ent. Soc. v. p. 69, California.

Eurygenius campanulatus, sp. n., *id. ibid.*, Vancouver Island.

ANTHICIDÆ.

Neogonus plasoni, Hampe [Zool. Rec. x. p. 292]. The genus, being founded on a sexual character, cannot stand; the description is amended, and the insect dubiously referred to the *Melandryidæ*. G. Kraatz, B. E. Z. xviii. pp. 351 & 352.

MORDELLIDÆ.

Mordella albo-signata, Muls., = *bisignata*, Redt.; *M. basalis*, Costa, = *fasciata*, var.; *M. viridescens* and *brevicauda*, Costa, = *aculeata*, var. (Mulsant's alteration of the latter to *brachyura*, because of *brevicauda*, Boh., is not required, and the chief character of the insect is a malformation); *M. sacheri*, Friv., Gemm., = *auro-fasciata*, Com.; *M. humerosa*, Boh., and *pulchella*, Muls., belong to *Mordellistena*; *Mordellistena brunnea*, F., and *axillaris*, Gyll., = *humeralis* varr.; *M. inaequalis*, Muls., *pusilla*, Redt., = *parvula*, Gyll.; *M. extensa*, Ros., = *episternalis*, Muls.; *M. rectangula*, Thoms., = *grisea*, Muls., = *purpurascens* and *minima*, Costa, = *micans*, Germ.; *M. subtruncata*, Muls., = *brevicauda*, Boh.; *M. stricta*, Costa, = *pumila*, Gyll.; *M. flexipes*, Muls., = *stenidea*, Muls., ♂; *Anaspis forcipata*, Muls., = *pulicaria*, Costa; *A. lateralis*, Thoms., = *thoracia*, L., Gyll., which is not identical with *flava*, L.; *A. picta*, Hampe, = *maculata*, Geoffr. C. Emery, B. E. Z. xviii. pp. 445 & 446 (chiefly from an examination of types).

RHIPIDOPHORIDÆ.

A. Laboulbène, Ann. Soc. Ent. Fr. (5) iv. pp. 45-48, pl. ii. figs. 1-7, describes and figures the pupa of a coleopterous insect (dubiously referred to the neighbourhood of *Symbius*), enclosed in the pupiform hardened skin of the larva, found at Cannes, and originally supposed to belong to the *Muscidæ*.

Metecus paradoxus. Instructions as to examining cells in wasp-nests; A. Rouget, CR. Ent. Belg. 1874, p. vii.

Trigonodera angulata, "new species," J. G. Wood, "Insects Abroad," p. 186, fig. 88, no locality or description given.

STYLOPIDÆ.

Dates and times of captures of *Stylops* noted; it occurs between the hours of 9 & 12 in the morning, and not later than April. F. Smith, P. E. Soc. 1874, p. ix.

CANTHARIDÆ.

Meloe æneus, Cast., = *purpurascens*, Germ.; the name *M. latreillii*, Gemm. & von H., is not required for the species, which is quite distinct from *æneus*, Tausch.; L. Bedel, Bull. Soc. Ent. Fr. (5) iv. p. cli.

Cantharis vesicatoria. Note on a continuous colony near Cambridge; Ent. Ann. 1874, p. 59. Indications of the beetle being parasitic on some Hymenopterous insects; A. Laboulbène, Bull. Soc. Ent. Fr. (5) iv. p. lxxxviii.

Cantharis tenebrosa, Lec., ♂ described; G. H. Horn, Tr. Am. Ent. Soc. v. p. 38.

Epicauta rileyi, p. 37, Arizona, *alphonsii*, p. 38, California, spp. nn., *id. l. c.*

Cantharis crotchi, p. 38, *insperatus*, p. 39, spp. nn., *id. l. c.*, California.

Cephaloon unguare, White Mountains, Lake Superior, *tenuicorne*, Vancouver's Island; J. L. Leconte, P. Bost. Soc. xvi. p. 275, spp. nn.

CEDEMERIDÆ.

Lethonymus. Observations on this genus, and varieties, &c., of *L. difformis*; C. A. Dohrn, S. E. Z. xxxv. pp. 268 & 269.

Techmessa, g. n., F. Bates, Ann. N. H. (4) xiii. p. 113. Nearest *Cycloclerus*, but with 3rd joint of antennæ short. *T. concolor* and *telephoroides*, spp. nn., *id. ibid.*, New Zealand.

Xanthochroa californica, sp. n., G. H. Horn, Tr. Am. Ent. Soc. v. p. 39, California.

Mycterus quadricollis, *id. l. c.* p. 42, California; *M. gracilior*, L. Fairmaire, Pet. Nouv. vi. p. 388, Algeria: spp. nn.

Asclera discolor, sp. n., J. L. Leconte, Tr. Am. Ent. Soc. v. p. 70, California.

CURCULIONIDÆ.

J. L. LECONTE, Am. Nat. viii. pp. 385–396, 452–470, after reviewing the classifications of Schönherr, Lacordaire, Jekel, Suffrian, and C. G. Thomson, refers to Horn's observation [Zool. Rec. x. p. 295] that the "*Brachyrhynques*," like the *Cossonides* and *Calandrides*, differ from the "*Mecorhynques*" in not having a different number of dorsal abdominal segments in the sexes. This he states to be erroneous as regards the *Brachyrhynques*; but he attaches great importance to Horn's discovery as regards the other groups, and uses it as a primary division, arranging the *Rhynchophora* into 3 sets, each of "a corresponding value to the individual series of normal Coleoptera (*e. g.*, Adephaga, Clavicornia, Lamellicornia, &c.)." The following classification is proposed (chiefly with reference to American species):—

Series. I. HAPLOGASTRA. Abdomen alike in both sexes; dorsal segments 7, coriaceous, with the exception of the 7th, which forms the pygidium and is small and corneous; ventral segments not prolonged upwards into a sharp edge; elytra without lateral fold on the inner

surface, epipleuræ usually distinct; antennæ straight, 11-jointed; front coxæ conical, prominent; prosternum very short in front of coxæ; ventral sutures of abdomen straight (other variable characters given). The affinities of this series are in an ascending direction with the rostrated *Heteromera*, and in a descending one to the true *Curculionide* through the *Attelabidæ*, and to the *Belidæ* through the *Rhynchitidæ*. It contains the following families:—

A. Ventral segments nearly equal in length.....*Rhinomaceridæ*.

B. Ventral segments diminishing in length.

Mandibles flat, tibial spurs small*Rhynchitidæ*.

Mandibles stout, pincer-shaped, spurs large*Attelabidæ*.

Series II. ALLOGASTRA. Abdomen dissimilar in the sexes; dorsal segments 1-6, coriaceous or membranous, 7th large, corneous, undivided in ♀, divided into two in ♂; ventral segments prolonged upwards, forming a sharp edge, fitting into a corresponding groove on the inner face of the elytra, which are without epipleuræ.

A. Antennæ with a solid annulated club.

a. Tarsi narrow.

Gular margin very prominent, mentum retracted.

Prosternum not excavated*Amycteridæ*.

Prosternum excavated.....*Byrsopidæ*.

Gular margin not prominent, mentum large,

concealing mandibles*Brachyceridæ*.

b. Tarsi dilated, usually with a brush beneath.

Mandibles with deciduous tips*Otiorhynchidæ*.

Mandibles simple, usually pincer-shaped*Curculionidæ*.

B. Antennæ with 11 separate joints.*Brenthidæ*.

The first 3 and the last of these families are not sub-divided. The (American) *Otiorhynchidæ* are however grouped as follows:—Side-pieces of metathorax concealed or indistinct, *Otiorhynchini* (*Otiorhynchi*, *Trachyphloei*, *Periteli*), *Brachyderini* (*Amomphi*, *Geonomi*), *Leptopsini*, *Rhigopsini* (*Rhigopsis*, g. n., Leconte, l. c. p. 459; resembles *Rhytilorhinus*, but with mentum similar to that of the other *Adelognaths* of this family, and a distinct mandibular scar; *R. effracta*, sp. n., *ibid.*, S. California); side-pieces of metathorax narrow, distinct, *Dyslobini* (*Dyslobi*, *Ophryastes*, *Trigonoscutæ*), *Phyllobiini* (*Phyllobiini*, containing *Pachnæi*, *Phyllobii*, and *Macrostyles*; and *Tanymecini*, containing *Symmathes*, *Aphrasti*, *Tanymeci*, and *Cyphi*), *Entimini* (p. 458), *Evoitini* (*Evoitus*, g. n., Leconte, l. c. p. 458; type, *Otiorhynchus ? naso*, Lec.), *Eudiagogini*.

The *Curculionidæ* are thus grouped:—Antennal grooves extending to base of mandibles (*Brachyrhynchi*), *Sitonini*, *Bathyrini* (*Bathyrini*, g. n., Leconte, l. c. p. 462; somewhat resembles *Cratoparis* in the *Anthribidæ*. *B. dispar*, sp. n., l. c. p. 462, Arizona, Texas), *Alophini*; grooves not extending to base, *Ithycerini*, with gular peduncle broad-truncate, and *Mecorhynchi*, with gular peduncle long (stated to be too numerous to specify).

Series III. HETEROGASTRA. Abdominal segments alike in both sexes, ventral segments prolonged upward as in Series II.

A. Pygidium vertical or declivous ; *Calandridæ* (Calandrini, Rhinini, Cossonini), *Anthribidæ*.

B. Pygidium horizontal, smaller ; *Scolytidæ* (Platypodini, Scolytini), *Apionidæ*, *Belidæ*.

F. P. PASCOE, J. L. S. xii. pp. 1-99, pls. i.-iv., in pt. iv. of "Contributions towards a knowledge of the Curculionidæ," gives a systematic list of all the species published in that and the 3 preceding parts.

T. KIRSCH, B. E. Z. xviii. pp. 385-432, in the 3rd part of his "Beiträge zur Kenntniss der Peruanischen Käferfauna," describes new genera and species, with a few observations on others, based chiefly on Dr. Abendroth's collections. This portion comprises the 'Adélognathes' and 'Synmérides' of the 'Phanérognathes.'

W. ROELOFS concludes his description of species found in Japan by G. Lewis : Ent. Belg. xvii. pp. 121-176.

Walton's notes. Dates and pagination of the original issue given by E. C. Rye, Ent. Ann. 1874, pp. 72-74.

Brachyderides.

Liophlæus. European species discussed ; *L. atricornis*, Desbr., = *aquisgranensis*, Först. ; H. Tournier, CR. Ent. Belg. 1874, pp. cxiii.-cxvii. This collocation objected to by Desbrochers, who considers Tournier exaggerates the importance of the shape of the prothorax ; *l. c.* pp. cxxix.-cxxx. Tournier, *l. c.* p. cliv., replies ; in the ♀, the 3rd and 4th segments of abdomen are widely membranous at the posterior margin : he maintains the above synonymy.

Strophosomus curvipes, Thoms., near Paris ; L. Bedel, Bull. Soc. Ent. Fr. (5) iv. p. cxii.

Heydenia, g. n., Tournier, CR. Ent. Belg. 1874, p. cliii. Funiculus sub-compact, no transverse furrow between frons and rostrum. *H. crassicornis*, sp. n., *id. ibid.* Lake Baikal.

New species :—

Cneorhinus maroccanus, Tangiers, *heydeni*, Portugal, *tarsalis*, Andalusia, *diecki*, Algeçiras, *id. l. c.* p. clii. ; *C. tingitanus*, Morocco, *tumidus*, Spain, Desbrochers, Bull. Soc. Ent. Fr. (5) iv. p. cxcvii.

Liophlæus sparsutus (= *aquisgranensis*, Först. ; Desbrochers, *tom. cit.* p. cxxx. : this denied ; Tournier, *l. c.* p. clv.), Switzerland, Belgium, France, *ineditus*, Jura, p. cxiv., *aureopilis*, *viridanus*, Silesia, *kirschii*, Sarepta, p. cxv., *amplipennis*, *minutus*, Geneva, *modestus*, Jura, p. cxvi., *alpestris*, Valaisan Alps, *rotundicollis*, Geneva, p. cxvii. ; H. Tournier, *l. c.*

Catapionus intermedius, E. Siberia, *maculatus*, *viridanus*, Lake Baikal, *id. l. c.* p. clii.

Barynotus laticeps, Desbrochers, *l. c.* p. cccxvi. Pyrenees.

Acradidius milleri and *ochraceus*, Tournier, *l. c.* p. cliii. Syria.

Strophosomus bauduieri, Desbrochers, *l. c.* p. cxcviii. Sos ; *S. veladoi*, L. Perez Arcas, An. Soc. Esp. iii., p. 81, pl. iii. fig. 3, Santiago de Galicia.

Strophomorphus [see *Otiorhynchides*] *algericus*, Tournier, *l. c.* p. lxxvii.

Blidah; *S. impressicollis*, *tessellatus*, p. 606, *brunneus*, p. 607, *milleri*, *minutus*, *cretaceus*, p. 608, Syria, *id.* Ann. Soc. Ent. Fr. (5) iv.

Chiloneus cheverolati, H. Tournier, CR. Ent. Belg., 1874, p. lxxxvi. Portugal; *C. brevithorax*, Desbrochers, Bull. Soc. Ent. Fr. (5) iv. p. ccxxvi., Cyprus.

Eusomus beckeri, Tournier, l. c. p. lxxxvi. Sarepta.

Brachyderes brucki, La Granja, *strictus*, Branuelas, *heydeni*, Guarda, Tournier, Pet. Nouv. vi. p. 455; *B. analis*, Desbrochers, l. c. p. ccxxvi. Ajaccio.

Naupactus armatus, p. 385, *jekeli*, p. 386, *obsoletus*, p. 387, T. Kirsch, B. E. Z. xviii. Peru.

Mimographus griseus, *id.* l. c. p. 338, Peru.

Metallites carpathicus, K. Brancsik, B. E. Z. xviii. p. 229, Carpathian Mountains.

Polydrosus deliciosus (= *cinctus*, Desbr.; Desbrochers, Bull. Soc. Ent. Fr. (5) iv. p. cxxxi.: this denied by Tournier, *tom. cit.* p. clvi.) and *roseus*, Tournier, CR. Ent. Belg. 1874, p. lxxxvii. Tangiers.

Thylacites ahenus, Spain, *olivieri*, Bone, p. cxcviii., *seriesetulosus*, pp. ccxxvii. Anti-Libanus, Desbrochers, l. c.

Tanymecus planus, Tournier, Pet. Nouv. vi. p. 456, Arabia, *T. revelierii*, Tuscany, *rotundicollis*, Sarepta, *id.* CR. Ent. Belg. 1874, pl. lxxxviii.; *T. bidentulus*, Desbrochers, l. c. p. ccxxvii. Sarepta.

Menetypus biseriatus, Kirsch, l. c. p. 388, Peru.

Platyomus tripunctatus, *id.* l. c. p. 389, Peru.

Eustales micans, *id. ibid.* Peru.

Rhinoscapa basilica, p. 1, *aulica*, *formosa*, p. 2, *alma*, *opalescens*, p. 3, *verrucosa*, fig. 2 (? = *Curc. amictus*, Wied.), *sellata*, fig. 3, *stolifera*, p. 4, *miliaris*, *carinata*, p. 5, E. Indian Archipelago, *staintoni*, p. 2, fig. 1, New Guinea; F. P. Pascoe, J. L. S. xii. pl. i.

Psaldium aurigerum, Desbrochers, l. c. p. ccxxvii. Syria.

Otiorhynchides.

DE MARSEUL, L'Ab. pp. 453-658, 740-800 (separate pagination), completes his compiled monograph of this group [Zool. Rec. x. p. 296], by publishing a 2nd part, apparently partly written by Seidlitz, and containing an analytical table of the species of *Otiorhynchus* by Stierlin (pp. 769-800), with which is incorporated a monograph of the *Phyllobiides* of Europe, including the borders of the Mediterranean, by J. Desbrochers des Loges, pp. 659-748. A general table is given, pp. 801-816. The two last sheets, bearing date September and October, 1873, were issued in L'Ab. livr. 2, 1875, and with the other sheets, dated from July, 1872, to September, 1873, but issued in 1874, form part of vol. xi. of that work (v. 2^{me} sér.). *O. schaufussi*, Mill., is a *Stomodes*; *O. hispidus*, Stier., = *Paramira rudis*, Boh.; *P. setosa*, Seidl., is re-named *islamita* (p. 458). *Strophomorphus* is not a sub-g. of *Strophosomus*, but allied to *Epiphaneus* in this group, and to it *Strophosomus albarius*, Rche., and *Pholicodes brevisculus*, Mars., are referred. A var. *pyrenæus* is described of *Barypithes brunnipes*, p. 582; *B. punctirostris*, Boh., = *mollicomus*, Ahr.; *B. teneæ*, Boh., should probably be read *tener*; a var.

andalusicus of *B. sulcifrons*, Boh., is described from Granada, p. 587. *Trachyphlæus asphaltinus*, Gyl., *ex. typ.*, and ? *Mimotermus raymondi*, Gaut., = *Trachyphlæus aristatus*, Gyl. : *T. sabulosus*, Redt., ? = *inermis*, Boh. ; *Cathormiocerus chevrolati*, Seidl., ♀, is re-named *mutandus*, p. 647, *C. excursor*, Seidl., nec Stierl., is re-named *hirticulus*, p. 652 ; *Schaumius vuillefroyi*, C. Bris., = *C. lapidicola*, Chevr., which stands ; a var. n. (? sp. n.) *capimonti*, of *C. lethierryi*, Chevr., is described from Toulon and Algiers, p. 654. [Various changes in nomenclature are proposed, but are not here noticed, for the reasons given in Zool. Rec. viii. p. 299.]

H. TOURNIER, Ann. Soc. Ent. Fr. (5) iv. p. 605, does not agree with the reference [*suprà*] of *Strophomorphus* to this group ; he would retain it and *Pholicodes*, *Epiphaneus*, &c., in the *Brachyderides*, the true directions of the scrobes being inferior, though they are widely enlarged behind. *S. lineolatus*, Fairm., = *albarius*, Rche.

Otiorthynchus maurus, Scotch var. ; E. C. Rye, Ent. Ann. 1874, p. 101. *O. cenobita*, Costa, is a good species ; J. Emery, Nouv. et faits, No. 46, p. clxxxvi.

Stomodes gyrosicollis, Boh., var. n. *gracilior* ; K. Brancsik, B. E. Z. xviii. p. 230, Hungary.

Cathormiocerus socius corroborated as British ; E. C. Rye, Ent. M. M. x. p. 177.

Phyllobius pini, Mots., from Japan, described ; Desbrochers, Monogr. Phyllob. p. 660, note. *P. meridionalis*, Desbr., = *xanthocnemus*, Kies. ; *P. xanthocnemus*, Desbr., = *alpinus*, Stierl. ; *P. uniformis*, Msh., = *viridiareis*, Laich. ; *P. ligurinus*, Gyl., = *Polydrosus corruscus* ; *Ph. virens*, Boh., = *Pol. cervinus*, L. ; *Ph. candidatus*, Perris, and *Polydrosus senex*, Chevr., = *Metallites tibialis*, Gyl. ; *Ph. glycyrrhizæ*, Stierl., is a *Chloeobius* ; *Ph. pineti*, Redt., = *argentatus*, var. ; other synonymy is indicated, especially as to Schönherr's types, and some changes in nomenclature are proposed, against the author's own conviction (p. 747), upon the same ground as that mentioned in Zool. Rec. viii. p. 299.

Pseudomyllocerius, g. n., Desbrochers, l. c. pp. 662 & 739. Allied to *Phyllobius* ; scrobes short, as in *Ptochus*. For *Phyllobius dorsalis*, Man., *sinuatus* and *mus*, F.

Corigetus [? *Coriogiton*], g. n., *id.* l. c. pp. 662 & 746. Differs from *Myllocerius* in having a deep excavation followed by an elevation between the frons and the base of the rostrum. *C. marmoratus*, sp. n., *id.* l. c. p. 746, Siberia.

Otiorthynchus simoni, sp. n., L. Bedel, Bull. Soc. Ent. Fr. (5) iv. p. li. Digne, Basses-Alpes.

Holcorhinus seidlitzii, sp. n., H. Tournier, Bull. Soc. Ent. Fr. (5) iv. p. ccxi. Biskra.

Cænopsis reichii, sp. n., *id.* CR. Ent. Belg. 1874, p. lxxxix. Algeçiras.

Trachyphlæus fairmairii, sp. n., E. Reitter, Verh. Ver. Brünn, xii. (sep. copy) p. 14, Oran.

Cathormiocerus maritimus, E. C. Rye, Ent. M. M. x. p. 176, Portsea, S. Coast of England ; *C. diecki*, Seidlitz, in De Marseul's Monogr. Otiorth. p. 647, South Africa : spp. nn.

Timareta crinita, sp. n., F. P. Pascoe, Ann. N. H. (4) xiii. p. 383, Fremantle, Australia.

Eustylus funicularis, sp. n., T. Kirsch, B. E. Z. xviii. p. 390, Peru.

Phyllobius achardi,* p. 675, Turkey, Asia Minor, *brisouti*, p. 681, Jerusalem, *pilicornis*, p. 686, S. E. Europe, *pilipes*, p. 692, Sardinia, *reicheldius** [I], p. 694, Sicily, *etruscus*, p. 696, Italy, Austria, *brachicornis*,* p. 700, Austria, *fulvipilis*, p. 702, Italy, *breviatus*,* p. 705, Greece, Austria, *parviceps*, p. 707, Turkey, Asia Minor, *serripes*,* p. 708, Greece, *maculifer*,* p. 710, *stierlinensis*,* p. 714, Austria, *crassior*, p. 718, Siberia, *artemisæ*, p. 722, Swiss Alps, *mutabilis*, p. 724, E. Siberia, *latithorax*, p. 730, Siberia, Desbrochers, l. c. spp. nn. [The spp. marked * appear to be mere changes in nomenclature.]

Eremnides.

Callirhopalus, Hoch.; characters discussed by T. Kirsch, l. c. p. 146.

Prioncnemus [*Prionoc*; -*mis*, Schiödde, *Hym.*], g. n., *id.* l. c. p. 391. Allied to *Phytoscaphus* (the author observes that the true *Eremnides* and *Phytoscaphides* may be better separated by the shoulders, which are rounded in the former and prominent in the latter, than by Lacordaire's character of the more or less projecting pterygia); hind tibiae with many denticles and strongly cavernous corbels. *P. abendrothi*, sp. n., *id.* l. c. p. 393, Peru.

Leptopides.

Polyteles setosus, sp. n., T. Kirsch, l. c. p. 393, Peru.

Brachycerides.

L. BEDEL, Ann. Soc. Ent. Fr. (5) iv. pp. 119-211, pl. iv., revises the Mediterranean species of *Brachycerus*. In the introductory portion, E. Perris describes and figures the larva and pupa of *B. albo-dentatus*, Gyl., pp. 125-133, pl. iv. figs. 1 & 2; this larva is found in the bulb of garlic in Corsica. *B. scabratus*, Dej., *tuberculatus*, Dahl, *semiceneus*, Desbr., *sulcifrons*, Gyl., *muricatus*, Ol., = *algirus*, F.; *B. superciliosus* and *lutosus*, Gyl., *4-sulcatus*, Fisch., *pulverulentus*, Ol., = *cineus*, Ol.; *B. cirrosus*, Luc., = *scutellaris*, Luc., fig. 14; *B. europæus*, Pradal, = *pradierii*, Fairm.; *B. hespericus*, Dej., *vespertilio* and *scutipennis*, Desbr., *opacus*, Woll., *insignis*, Mill., *teticus*, Luc., *superciliosus*, Labr. & Im., *europæus*, Gyl., = *plicatus*, Gyl., figs. 8, 13, 16; *B. velutinus*, Desbr., = *kabylianus*, Desbr.; *B. cornifrons*, *hispidus*, *nubilus*, *sericeus*, *subvariolatus*, Desbr., *capensis*, Sch., *incultus*, *corrosus*, *pterygomalis*, Gyl., *ovatus*, Brullé, *serratus*, *mauritanicus*, *algirus*, Ol., *crispatus* (?), *lacunatus*, Latr., *quadratus*, Voet, *europæus*, Thunb., *barbarus*, L. (2), = *undatus*, F.; *B. sículus*, Dej., *albo-signatus*, Dahl., = *albo-dentatus*, Gyl.; *B. recticostatus*, *clathratus*, Desbr., *pterygomalis*, Luc., = *crispatus*, F.; *B. gerardi*, Buq., *hispanicus*, Dej., *curtulus*, Desbr., *fluctiger*, *latro*, *lateralis*, Gyl., *libertinus*, Fähr., *algirus*, Latr., = *barbarus*, L. (1); *B. globosus*, Dahl, *dahlii*, Dej., *sordidus*, Ramb., *parens*, *raffrayi*, Desbr., *peninsularis*, Chevr., *semituberculatus*, *algirus*, Luc., *variolosus*, Thunb., = *chevrolati*, Fähr.; *B. ventralis*, Desbr., *muricatus*, F., *nec* Ol., = *foveicollis*, Gyl.; *B. tauricus*, *insularis*, *olivieri*, *incertus*, *fimbriatus*, Desbr., *nodulosus*, *ornatus*,

orbipennis, *argillaceus*, Rche., *difformis*, Fald., *lutulentus*, *siculus*, Gyl., *besseri*, Kryn., *sinuatus*, *cribrarius*, *ægyptiacus*, Ol., *pisifer*, Thunb., = *junia*, Licht., of which many sub-varieties are indicated, *ægyptiacus*, *orbipennis*, *cribrarius*, and *sinuatus*, being retained as representing the chief races; *B. sibericus*, Thunb., is apparently a *Deracanthus*. Most of the above given synonymy is from an examination of types, and seems to differ from the author's previous views [Zool. Rec. ix. p. 258]. Details of structure are given, figs. 18-21.

Brachycerus pradieri, unlike the rest of the genus, which seem to attack the *Liliaceæ* exclusively, is found on *Centaurea aspera* in the Isle of Ré; Baron Bonnaire, Bull. Soc. Ent. Fr. (5) iv. p. cxcvi. The larva probably feeds on some liliaceous bulb; Laboulbène, *tom. cit.* p. ccxii. No such plant is found in the island; Bonnaire, *tom. cit.* p. ccxxi. *Pan-cratiæ maritimum* suggested; E. Lefèvre, *ibid.*

Brachycerus tursio, F. P. Pascoe, J. L. S. xii. p. 6, pl. i. fig. 10, Damaraland; *B. balearicus*, p. 151, figs. 3 & 17, Balearic Isles, *cylindripes*, p. 171, fig. 4, Tangiers, *hypocrita*, p. 190, figs. 5 & 10, Spain, *foveifrons*, p. 194, figs. 6 & 15, ? Syria, *spinicollis*, p. 205, figs. 7 & 12, Syria, L. Bedel, l. c. pl. iv. : spp. nn.

Pyrsoptides.

Herpes, g. n., L. Bedel, l. c. p. 212. To a certain extent, connects this group with the *Brachycerides*. Type, *Brachycerus porcellus*, Lacord.

Amycterides.

F. P. Pascoe, J. L. S. xii., describes the following new genera and species:—

Anascoptes, p. 7. In some respects like *Acantholophus*, but without ocular lobes, and with prominent eyes and well-limited scrobes running beneath the eye. *An. muricatus*, *ibid.* pl. ii. fig. 6, Swan River.

Polycreta, p. 8. Nearest *Hyborhynchus*, McL., but with a narrower and longer rostrum, especially narrow between the scrobes, and prominent and finely faceted eyes. *P. metrica*, *ibid.* pl. ii. fig. 2, Champion Bay.

Molochtus, p. 18. Allied to *Talaurinus*, but with a stout rostrum, transversely arcuate-excavate in front, and sulcate at the base, and the tarsi unusually dilated. *M. gagates*, *ibid.* pl. ii. fig. 9, W. Australia.

Chriotyphus, p. 19. Differs from *Talaurinus* in its long, ovate, slightly granulated eyes, which are near the prothorax, and in the sculpture of its rostrum, which is rather deep. *C. acromialis*, *ibid.* pl. ii. fig. 10, W. Australia.

Alexirhea, *ibid.* Resembles *Otidesus* in the bituberculate base of the rostrum, but with the scape of the more typical genera; perhaps better placed in the *Euomides*. *A. notata* (pl. ii. fig. 4), *aurita*, p. 20, *falsifica*, p. 21, W. Australia.

Myotrotus, p. 22. Perhaps nearer *Amorphorhinus* than any other genus, though some of the *Talaurini* are not very dissimilar. Abdomen remarkably square. *M. obtusus*, *ibid.*, pl. ii. fig. 5, Queensland.

Acantholophus nasicornis, *gladiator* (pl. ii. fig. 3), p. 6, *simplex*, p. 7, W. Australia.

Sclerorhinus molestus, p. 8, *marginatus*, p. 9, S. Australia, *echinops*, W. Australia, *meliceps*, Queensland, p. 10.

Talaurinus victor, p. 10, S. Australia, *funereus*, *pustulatus*, p. 11, *carbonarius*, p. 12, *molossus*, *melanopsis*, *simulator*, p. 13, *tessellatus*, p. 15, fig. 11, *geniculatus*, *lemmus*, *pupa*, *cariosus*, p. 18, W. Australia, *phrynos*, p. 12, Queensland, *macleayi*, *encaustus*, p. 15, King George's Sound, *tenuipes*, p. 15, fig. 2, Swan River, *capito*, fig. 7, Champion Bay, *levicollis*, fig. 8, Victoria, p. 17, pl. ii.

Cubicorhynchus cichlodes, p. 18, W. Australia, *sterilis*, p. 19, Victoria (this genus remains without a type, and the contiguity of the anterior coxæ is of no generic value. *Acantholophus scotobioides*, Waterh., probably = *C. bohemani*, ♂, with which *C. angularis*, W. Maccl., is identical. Pascoe, l. c. note). •

Molytides.

Liosomus oblongulus, Boh., ♂ figured, frontisp. fig. 6 ; *L. troglodytes*, Rye, both sexes recorded from Britain. E. C. Rye, Ent. Ann. 1874, p. 103.

Anisorhynchus gallicus, Desbrochers, Bull. Soc. Ent. Fr. (5) iv. p. clxxi., S. France ; *A. cornutus*, L. Perez Arcas, An. Soc. Esp. iii. p. 143, pl. iii. fig. 4, Valencia : spp. nn.

Liosomus isabella, sp. n., H. Tschapeck, S. E. Z. xxxv. p. 207, Styria.

Scythropides.

Catachæus scintillans, p. 22, Philippine Islands, *bracteatus*, I. Tsushima, *chloroticus*, Formosa, p. 23 ; F. P. Pascoe, J. L. S. xii., spp. nn.

Promecopides.

Promecops nebulosus, p. 394, *infidus*, p. 395, spp. nn., T. Kirsch, B. E. Z. xviii., Peru.

Oleonides.

CAPMONT'S monograph of this family is continued by the discussion of *Larinus* and *Lixus*, under the supervision of C. E. Leprieur, Ann. Soc. Ent. Fr. (5) iv. pp. 49-78, 283-328, 469-506 [Zool. Rec. x. p. 299]. *Larinus lineaticollis*, Sch., and *pollinis*, Laich., = *senilis*, F. ; *L. guttifer*, S., = *maurus*, Ol. ; *L. glabrirostris* and *timidus*, Sch., = *cynaræ*, F. ; *L. cirsi*, Stev., *teretirostris* and *costirostris*, Sch., = *cardui*, Rossi ; *L. sulphuratus*, Sch., = *bardus*, Gyl. ; *L. carinifer* and *planus*, Sch., = *flavescens*, Dej. ; *L. sericatus*, S., = *syriacus*, S. ; *L. foveicollis*, S., = *jaceæ*, F., var. ; *L. acanthiæ*, S., = *afer*, S., ♀ ; *L. tournieri*, Stierl., = *centaureæ*, Ol. ; *Lixus biimpressus*, Gyl., = *paraplecticus*, L., var. ; *L. geminatus*, Boh., and ? *connivens*, Gyl., = *iridis*, Ol., of which a var. *conformis* is described, p. 475 ; *L. anguiculus*, Boh., = *anguinus*, L. ; *L. tenuirostris*, Boh., = *siculus*, Boh., ♀ ; *L. furcatus*, *inops*, and *parallelus*, Sch., are local modifications of one type ; *L. nanus*, Boh., *cretaceus*, Chev., = *brevirostris*, Sch. ; *L. angustus*, Hbst., *rufulus*, Sch., = *sanguineus*, Rossi ; *L. brevicaudatus*, Luc., *submaculatus* and *pardalis*, Boh., *brevicaudis*, Küst., = *umbellatarum*, F.

Lixus cribricollis, Boh. ; observations on the ochreous powder covering

certain examples; *A. Bellevoye*, Pet. Nouv. vi. p. 368. *L. augurius*, Boh., from Minorca; Martinez-y-Saez, Act. Soc. Esp. iii. p. 67.

Plagiographus arciferus, sp. n., A. Chevrolat, An. Soc. Esp. iii. p. 158, Aranjuez, Grenoble.

Porocleonus albo-guttatus, sp. n., *id. l. c.* p. 159, Spain.

Cleonus weisii, E. Reitter, Verh. Ver. Brunn., xii. (sep. copy) p. 13, Saïda; *C. planidorsis*, L. Fairmaire, Pet. Nouv. vi. p. 388, Souff: spp. nn.

Larinus hedenborgi, Rhodes, *ægyptiacus*, Abyssinia, Egypt, p. 63, *albo-lineatus*, p. 64, Egypt, *inæqualicollis*, p. 65, S. Russia, Syria, *ochroleucus*, Astrabad, *kirschi*, Egypt, p. 75, *atomarius*, p. 283, Trebizond, *reichii*, p. 286, Spain, *puncticollis*, p. 287, Taurus, Syria, *griseus*, p. 288, *castaneus*, p. 299, *heydeni*, p. 314, *lejeunii*, p. 321, *westringi*, p. 326, Algeria, *suborbicularis*, p. 289, Spain, Morocco, *maroccanus*, p. 290, Morocco, *arabicus*, p. 294, Arabia, *crassus*, p. 296, Tarsus, *australis*, p. 303, S. Europe, *ferrugineus*, Altai, *griseo-tessellatus*, Biskra, p. 305, *serratulæ*, p. 306, Sarepta, *ovaliformis*, p. 315, Anatolia, *schænherrri*, p. 320, Spain, Algeria, *albo-marginatus*, p. 323, Spain, *orientalis*, p. 325, 'Orient,' Capiomont, *l. c.*, spp. nn.

Lixus reichii, p. 479, Algeria, Morocco, *gracilicornis*, p. 482, Syria, *castellanus*, p. 485, Spain, Oran, *bidens*, p. 488, Sicily, *validirostris*, p. 497, Oran, Capiomont, *l. c.*; *L. breweri*, Albany, *mastersi*, N. S. Wales, F. P. Pascoe, Ann. N. H. (4) xiii. p. 384: spp. nn.

Ileomus laticollis, sp. n., T. Kirsch, B. E. Z. xviii. p. 396, Peru.

Hylobiides.

Hilipus apicalis, p. 397, *steini*, p. 328, *depressifrons*, p. 399, *inornatus*, p. 400, *funestus*, p. 401, *æquabilis*, p. 402, *iniquus*, p. 403, spp. nn., *id. l. c.*, Peru.

Pissodes nitidus, p. 121, *obscurus*, p. 122, spp. nn., Roelofs, Ann. Ent. Belg. xvii., Japan.

Orthorhinus palmaris, pl. i. fig. 7, *arrogans*, spp. nn., F. P. Pascoe, J. L. S. xii. p. 23, Ceram.

Erirhinides.

H. TOURNIER, Ann. Ent. Belg. xvii. pp. 63-116, proposes a new classification of this group (based on European forms) from which he eliminates *Mecinus* and *Geranorhinus*, introducing certain of the *Tychiides*. *Mecinus* and Lacordaire's *Gymnetron* are to form a new tribe, *Mecinides*, placed between the *Cionides* and a group *Miarides* (consisting of *Miarus*). *Geranorhinus* should be placed near *Coniatus*. *Philernus* is removed to the *Hydronomides*, and *Smicronyx* to the true *Erirhinides*. *Aubœonymus picteti*, Tourn., is a *Pachytychius*, from which genus *Styphlotychius*, Jek., is not separable, and of which a new species, *granulicollis*, from Portugal and Morocco, is indicated at p. 89. *Barytychius hordei*, Brullé, is distinct from *squamosus*, Gyl., and *albo-guttatus*, Redt., is probably to be referred to it. The old divisions of *Notaris* and *Erirhinus* are revived, *bimaculatus* being retained as type of the first and *festuæ* of the second, and two new genera are created for groups represented by *sparganii* and

scirpi. *Notaris* (and *Icaris*, g. n.) has no spines or spurs at the apex of the tibiae, *Erirhinus* (and *Erycus*, g. n.) having these spines, one on each side of the mucro. *Dorytomus auripennis* and *meridionalis*, Desbr., = *vorax*, F., varr., of which other varr. *frivaldszkii* (Hungary) and *planirostris* (Algeria) are described, p. 97. *D. variegatus*, Gyl., ? = *tremulae*, Payk., of which *amplithorax*, Desbr., is the ♀, and *tenuirostris*, Boh., is probably a small ♂; *D. suratus*, Gyl., is distinct from *bituberculatus*, Zett.; *D. fructuum*, Marsh., = *punctator*, Hbst., nec *pectoralis*, Panz. [both spp. are attributed to England], with which *nebulosus*, Gyl., is identified; *Bagous minutus*, Hochhuth (1847), is re-named *hochhuthi*, p. 110 [the other *B. minutus* is that of Mulsant & Rey (1859), consequently it is the latter that should have been re-named], *Brachyonyx indigena*, Hbst., = *pineti*, Payk. (1792), of which a dark var. is noted. The whole group is thus divided:—1, *Erirhinides vrais* (*Procas*, *Acrisius*, *Jekelia*, *Brachypus*, *Elleschus*, *Smicronyx*, *Sharpia*, *Aubeonymus*, *Pachytychius*, *Barytychius*, *Grypidius*, *Notaris*, *Erirhinus*, *Dorytomus*, *Hypoglyptus*, and 6 new genera); 2, *Hydronomides* (*Hydronomus*, *Bagous*, *Ephimeropus*, *Philernus*); 3, *Tanyssphyrides* [= *Cryptoplides*, Lac., but that name changed, as *Cryptoplus* is exotic!], *Tanyssphyrus*, *Endaliscus*, *Anoplus*); 4, *Brach[y]ony[chi]des* (*Brachyonyx*).

Roelofs, CR. Ent. Belg. 1874, p. lxxx., properly objects to Tournier's altering classification on the basis of a study restricted to Europe. Van Volxem, l. c. p. lxxxii., endorses this opinion, especially objecting to the alteration of the name *Cryptoplides*.

Desbrochers, tom. cit. pp. cxxviii. & cxxix., maintains the specific distinctness of his *Erirhinus auripennis* and *meridionalis*; *E. nebulosus*, Gyl., and *pectoralis*, Pz., are not identical. *Acrisius* should not have been included in the group; it is near *Aparopion*, Hampe.

Tournier, l. c. pp. cliii. & cliv., reasserts the identity of Desbrochers' 2 species with *E. vorax*; *Dorytomus pectoralis* = *nebulosus*, ♀, and *punctator* and *fructuum* are also sexes of one species.

Nedyleda, Pascoe, re-characterized; F. P. Pascoe, J. L. S. xii. p. 76. It agrees with *Dorytomus* in the absence of ocular lobes, and with *Erirhinus* in its simple femora.

Nychiomma, Pasc., is not to be placed here, but in the *Prionomerides*; id. l. c. p. 89, note.

Mecinus. Synoptical table of species, with full descriptions of *M. læviceps*, *reichii*, *nasutus*, *humeralis*, and *fairmairii*; H. Tournier, Ann. Ent. Belg. xvii. pp. 40–46.

Geranorhinus elegans, Seidl., = *rufirostris*, Chevr.; Puton, Bull. Soc. Ent. Fr. (5) iv. p. 331.

New genera and species :—

Acrodya, Tournier, Ann. Ent. Belg. xvii. p. 71. Resembles *Procas* in form and *Acrisius* in colour, &c.; differing from both in its sculpture and posteriorly confluent scrobes. *A. brucki*, id. l. c. p. 72, Tuscany.

Colchis, id. l. c. p. 73. Differs from *Jekelia* in its short, straight, robust rostrum. *C. tibialis*, p. 74, Egypt, *carinirostris*, p. 75, Mingrelia, id. l. c.

Pseudostyphlus, id. l. c. p. 75. Differs from *Erirhinus* in its short,

robust legs, stout, straight tibiæ, simply villose tarsi, funiculus with only the first joint longer than the rest, and squamose bristly clothing, as in *Orthochaetes*. *Erirhinus pillumus*, Gyll., *E. bilunulatus*, Desbr. (*artemisizæ*, Becker, ? ined.), and ? *E. pilifer*, Gredl. [The author notices that Perris had described the first of these species in 1857 as a *Bagous*; Walton, Ann. N. H. (2) vii. (1851) p. 317, quotes Kirby's MS. name of *Bagous beckwithi* for it, stating also that he himself sent it to Germar with the name *Bagous tibialis*, and that Germar returned it as apparently a *Styphlus*].

Oryx, id. l. c. p. 91. Legs straight, tarsi not spongy beneath, clothing and facies different from *Erirhinus*. *E. nitidus*, Chevr.

Icaris, id. l. c. p. 93. Differs from *Notaris* in its 2nd abdominal segment being twice as long as the two following together, with a straight suture, &c. *Erirhinus sparganii* and *pertinax*, Gyl., *globicollis*, Fairm., *cinereus*, Mill.

Erycus, id. *ibid.* Differs from *Erirhinus* in having prothoracic ocular lobes, the prosternum emarginate in front, and the tibiæ stouter, less curved, and with a short mucro. *Erirhinus scirpi*, F., *acridulus*, L., and *petax*, Sahlb., and *Erycus brancsiki*, id. l. c. p. 95, Hungary.

Glaucopela, Pascoe, Ann. N. H. (4) xiii. p. 385. Differs from *Erytenna* in its subulate rostrum, basal scrobes, and short scape, and from *Cydmaea* in the bisinuate base of its thorax and unstriated rostrum. *G. unicolor*, id. *ibid.*, Champion Bay.

Phæodica, id. *ibid.* Distinct from *Dicomada* and *Cydmaea* by the scrobes running beneath the rostrum, *P. fulvicornis*, W. Australia, *scutellaris*, Swan River, id. l. c. p. 386.

Empira, id. l. c. p. 386. Rostrum approaching that of the *Hyperides* in thickness; claw-joint stout, claws divaricate. *E. variegata*, id. l. c. p. 387, Swan River.

Cenchrena, id. J. L. S. xii. p. 24. Tarsi 3-, funiculus 7-jointed, scrobes straight, no scutellum. *C. fasciata*, pl. iii. fig. 9, Aru, *pæcila*, Batchian, p. 24, *suturalis*, p. 25, id. l. c.

Thechia, id. l. c. p. 25. Differs from *Cenchrena* in having a scutellum, and no spurs at the apex of the tibiæ. *T. pygmæa*, id. *ibid.*, Champion Bay.

Tithene, id. *ibid.* Provisionally placed near *Meriphus*. *T. microcephala*, id. l. c. p. 26, pl. iii. fig. 13, Sarawak.

Orsophagus, Roelofs, Ann. Ent. Belg. xvii. p. 123. Near *Philernus* and *Colabus*, differing from the former in its prothorax not being emarginate beneath, and from the latter in the form of its rostrum, &c. *O. 3-fasciatus*, id. l. c. p. 124, Japan.

Celia [Zimmerman, *Coleoptera*, 1832; Shuckard, *Hymenoptera*, 1837], id. l. c. p. 126. Eugnomid, near *Rhopalomerus* and *Stephanorhynchus*, but with abdominal segments arched at apex; ? = *Ixalma*, Pasc. (Tachygonid). *C. dentipes*, id. l. c. p. 127, Nipon.

Procas putoni, Tournier, Bull. Soc. Ent. Fr. (5) iv. p. ccix., Biskra.

Echinocnemus bipunctatus, Roelofs, l. c. p. 123, Japan.

Sharpia (treated as new, p. 84, but characterized in CR. Ent. Belg. xvi. p. cxxxvii.) *heydeni*, p. 85, Syria, *grandis*, p. 86, Persia, Tournier, Ann. Ent. Belg. xvii.

Dorytomus amplipennis, id. l. c. p. 101, Caucasus; *D. maculipennis*, Roelofs, tom. cit. p. 124, Nagasaki.

Bagous friwaldskii, Hungary, p. 104, *mingrelicus*, p. 105, Mingrelia, *revelierii*, p. 106, Corsica, *olcesii*, p. 108, Tangiers, *chevolati*, p. 109, Portugal, Morocco, Tournier, l. c.

Geranorhinus seidlitzii, T. Kirsch, B. E. Z. xviii. p. 22, Caucasus.

Tanysphyrus major, Roelofs, l. c. p. 125, Japan [*T. lemnae* occurs there also].

Smicronyx puncticollis, p. 80, *modestus*, p. 83, Geneva, *seriepilosus*, Turkey, *funebri*, Algeria, p. 81, *scops*, Sarepta, *cretaceus*, Ionian Isles, *nebulosus*, S. France, Spain, *striatipennis*, Syria, Hungary, *kiesenwetteri*, Algeria, p. 83, *rufipennis*, p. 84, Egypt, *revelierii*, p. 114, Corsica, Tournier, l. c.

Penestes apicalis, p. 205, *alternans*, p. 405, T. Kirsch, l. c., Peru.

Phyllotrox (funiculus 7-jointed) *speculator* and *pusillus*, id. l. c. p. 406, Peru.

Amalactides.

Tranes insularis, sp. n., F. P. Pascoe, Ann. N. H. (4) xiii. p. 387, Lord Howe Island.

Ambatides.

Ambates rufipes, p. 408, *pusillus* and *palliat*, p. 409, *bimaculatus*, p. 410, *rufitarsis*, p. 411, *modestus*, p. 412, spp. nn., T. Kirsch, B. E. Z. xviii. Peru (*A. griseolus*, Er., re-described for comparison, p. 407).

Ozycorynides.

Metrioxena (which is not like *Apion*) *subvittata*, sp. n., F. P. Pascoe, J. L. S. xii. p. 26, Macassar.

Belides.

Dicordylus ithyceroides, Lac., = *D. (Rhinitia) binotatus*, Philippi; *D. hilipoides*, L., = *marmoratus*, Phil.; *D. pupillatus*, Pasc., = *annulifer*, Phil.; synonymy of Chilian *Homaloceri* described by Fairmaire and Germain is also indicated. Pascoe, l. c. p. 87, note.

Belus wallacii, p. 26, Aru, *inornatus*, p. 27, Mysol, spp. nn. id. l. c.

Apionides.

Apion opeticum, Bach ?, from England; E. C. Rye, Ent. M. M. xi. p. 156.

Apion pallidirostre, japonicum, p. 128, *unicolor*, *griseo-pubescent*, p. 129, Roelofs, Ann. Ent. Belg. xvii. Japan; *A. ryei*, T. Blackburn, Ent. M. M. xi. p. 128, Shetland; *A. beuthini*, A. Hoffmann, S. E. Z. xxxv. p. 208, Spain; *A. comosum*, p. 387, *pulicare*, p. 388, Swan River, *argutulum*, p. 388, Queensland, F. P. Pascoe, Ann. N. H. (4) xiii.; *A. strangulatum*, p. 413, *tenerum*, *crassipes*, p. 414, *infernum*, p. 415, *interstitiale*, *nitidum*, p. 416, *pyriforme*, p. 417, *sulphuripes*, p. 418, *luteipes*, *macromerum*, p. 419, *opacum*, p. 420, *cerulescens*, p. 421, *splendens*, *griseocens*, p. 422, *areolatum*, p. 423, T. Kirsch, B. E. Z. xviii. Peru: spp. nn.

Attelabides.

Phialodes, g. n., Roelofs, Ann. Ent. Belg. xvii. p. 137. Near *Trachelolabus*, Jek., but with strongly marked sexual differences. *P. rufipennis* and *distinctus*, spp. nn., *id. l. c.* p. 138, Japan.

Apoderus fulvus, p. 130, *longicollis*, *nigricollis*, p. 131, *jekeli*, p. 132, *rufescens*, *nitens*, p. 133, *montanus*, p. 134, *balteatus*, *rufiventris*, p. 135, *minimus*, *tigrinus*, p. 136, spp. nn., *id. l. c.* Japan.

Attelabus cupreus, *splendens*, p. 139, *politus*, p. 140, *id. l. c.* Japan; *A. (Omolabus) tricolor*, T. Kirsch, B. E. Z. xviii. p. 423, Peru: spp. nn.

Evops calestina, *violacea*, p. 27, *plicata*, 3-gemmata, *aerosa*, p. 28, *divisa* (pl. iii. fig. 6), *jekeli*, p. 29, E. Indian Archipelago, *clavigera*, *eucalypti*, p. 28, Queensland, *amethystina*, p. 29, Singapore; F. P. Pascoe, J. L. S. xii. spp., nn.

Rhinomacerides.

Rhynchites heros, p. 141, *regalis*, *ursulus*, p. 142, *plumbeus*, p. 143, *sanguinipennis*, p. 144, *amabilis*, *pilosus*, p. 145, *assimilis*, p. 146, *singularis*, *crioceroides*, p. 147, *brevirostris*, p. 148, *unicolor*, p. 149, *planipennis*, p. 150, spp. nn., Roelofs, *l. c.* Japan.

Eugnamptus aurifrons, *id. l. c.* p. 151, Japan; *E. tropicus*, T. Kirsch, B. E. Z. xviii. p. 424, Peru: spp. nn.

Auletes fumigatus, p. 151, *testaceus*, *uniformis*, p. 152, *id. l. c.* Japan; *A. filirostris*, p. 388, Albany, *calceatus*, Champion Bay, *turbidus*, *nigritarsis*, S. Australia, p. 389, F. P. Pascoe, Ann. N. H. (4) xiii.: spp. nn.

Erodiscides.

Atenistes, Pasc. [Zool. Rec. vii. p. 312], = *Ludoviz*, Cast.; F. P. Pascoe, J. L. S. xii. p. 88, note.

Erodiscus ibis, p. 425, *tringa*, *numenius*, p. 426, *gallinago*, p. 427, spp. nn., T. Kirsch, B. E. Z. xviii. Peru.

Otidocephalides.

Læmomerus, g. n., *id. l. c.* p. 427. To be placed before *Otidocephalus*, of which it has the form, having also the prosternum narrow before the coxæ. Claws simple. *L. ambiguus*, sp. n., *id. l. c.* p. 429, Peru.

Magdalinides.

Magdalinus armicollis, Say, feeds on elm in Massachusetts. Transformations and habits described, and Hymenopterous parasites mentioned. *M. barbitus* and *pallidus*, Say, are referred to it. H. G. Hubbard, Psyche, i. pp. 5 & 6.

Carcilia, g. n., Roelofs, *l. c.* p. 152. Should form a separate tribe and be placed near *Magdalinus*, having however very great analogies with *Lemosaccus*. *C. strigicollis*, sp. n., *id. l. c.* p. 153, Japan.

Balaninides.

Balaninus elephas breeding in chestnuts from Brittany; J. Bigot, Bull. Soc. Ent. Fr. (5) iv. p. cxiii.

Balaninus robustus, p. 155, *dentipes*, *distinguendus*, p. 156, *camellia*, *styracis*, p. 157, *macula-nigra*, p. 158. *albo-scutellatus*, *funebis*, p. 159,

flavescens, flavo-scutellatus, p. 160, *convexus, pictus*, p. 161, *crucifer*, p. 162, spp. nn., Roelofs, *l. c.* Japan (where *B. cerasorum*, Hbst., occurs).

Anthonomides.

Orchestes 5-maculatus, Chev., = *pubescens*, Stev., and is doubted to be identical with *semirufus*, Gyl.; H. Tournier, MT. Schw. Ent. Ges. iv. p. 181. Critical observations by Kraatz, *tom. cit.* p. 279.

Imachra, g. n., F. P. Pascoe, J. L. S. xii. p. 30. Allied to *Orchestes*, but with a stout rostrum, nearly transverse scrobes, and large eyes, occupying most of the head. *I. ruficollis*, sp. n., *id. ibid.* Sarawak.

Anthonomus basalis, p. 429, *zonarius*, p. 430, *sulcatus*, p. 431, T. Kirsch, B. E. Z. xviii. Peru; *A. bisignatus*, Roelofs, Ann. Ent. Belg. xvii. p. 162, Japan: spp. nn.

Minyrus japonicus, sp. n., *id. l. c.* p. 163, Japan.

Orchestes excellens, p. 164, *sanguinipes*, p. 165, *aterrimus, variegatus*, p. 166, *dorsoplanatus*, and *O. (Tachyerges) awomoriensis*, p. 167, *id. l. c.* Japan; *O. montanus*, A. Chevrolat, Bull. Soc. Ent. Fr. (5) iv. p. xxx. Monte Rosa: spp. nn.

Trigonocolides.

Trigonocolus sulcatus, sp. n. Roelofs, *l. c.* p. 168, Japan.

Prionomerides.

Themeropsis, g. n., F. P. Pascoe, J. L. S. xii. p. 30. Funiculus 7-jointed, eyes oblong, remote from prothorax; epipleura sharply defined by a ridge clothed with coarse hairs, carried on to the prothorax. *T. fimbriata*, sp. n., *id. l. c.* p. 31, pl. iii. fig. 7, Amazons.

Ochryomera, g. n., *id. l. c.* p. 31. Funiculus 7-jointed; tooth of anterior femora entire. *O. dissimilis*, *ibid.* pl. iii. fig. 3, Sarawak, *rufescens*, p. 32, Singapore, *id. l. c.* spp. nn.

Synnada, g. n., *id. l. c.* p. 32. Funiculus 6-jointed, but allied to *Ochryomera*. *S. currucula*, sp. n., *id. ibid.* Macassar.

Prionomerus pistior, sp. n., T. Kirsch, B. E. Z. xviii. p. 432, Peru.

Tychiides.

Sybines beckeri and *zuberi*, Sarepta, *planiusculus*, Algeria; these localities added [Zool. Rec. x. p. 307] by Desbrochers, CR. Ent. Belg. 1874, p. lxxv.

Tychius affinis, Beck., and *3-virgatus*, Desb.; differences stated. *Id. l. c.* p. lxxvi.

Lychnuchus, g. n., Roelofs, *l. c.* p. 169. *Elleschides*. For *L. tricolor* and *circulus*, spp. nn., *id. l. c.* p. 170, Japan.

Zephiantha, g. n., F. P. Pascoe, J. L. S. xii. p. 33. Near *Elleschus* and *Lignyodes*, though the abdominal segments are not very obviously curved at the side. *Z. pubipennis*, sp. n., *id. ibid.* Sumatra.

Styphlotychius [an Eirrhinid, teste Tournier] *puncticollis*, sp. n., E. Reitter, Verh. Ver. Brönn, xii. Heft 2, p. 12, Maskara.

Tychius ovalis, sp. n., Roelofs, *l. c.* p. 171, Japan.

Cionides.

Cionus scrophularie in Louisiana; S. V. Summers, Canad. Ent. vi. p. 137.

Nanophyes pubescens, p. 172, *albo-vittatus*, *pallipes*, p. 173, spp. nn., Roelofs, l. c. Japan.

Cryptorhynchides.

F. P. Pascoe, J. L. S. xii., describes the following new genera and species:—

Perrhæbius, p. 34. *Ithyporides* (all following being true *Cryptorhynchides*): differs from *Colobodes* in its stouter rostrum, the shortness of the basal joints of the funiculus, the sub-linear femora, angular tibiæ, &c. *P. ephippiger*, ibid. pl. i. fig. 6, Dorey, Aru.

Zeneudes, p. 35. Allied to *Empleurus*, but also to be placed near *Oreda*, from the form of its mesosternum, which is, however, sloped backwards, open, and indefinitely limited. *Z. sterculiæ*, p. 36, Queensland.

Cydostethus, p. 37. Habit and coloration of *Cyamobolus*, but more allied to *Euthyrhinus*. *C. solutus*, pl. i. fig. 11, Ceram, *lineolatus*, Amboina, p. 38.

Syrotelus, p. 38. Differs from *Rhynchodes* in the elytra not being keeled at the sides; the mesosternum arched; the femora attenuate at the base, and with a slight tooth beneath. Type, *Cyamobolus falleni*, Boh.

Cechania, p. 38. Differs from *Euthyrhinus* (which it resembles in habit and straight rostrum) by its pectoral canal terminating before the middle coxæ, and the scape not nearly reaching the eyes. *C. eremita*, p. 39, Japan.

Æchmura, p. 39. Very distinct from *Euthyrhinus* in its canaliculate femora. *Æ. emys*, ibid., Singapore.

Odosyllis, p. 40. Differs from *Nedymora* in the pectoral canal being cavernous at the apex, and extending only behind the anterior coxæ. *O. congesta*, ibid. pl. i. fig. 5, *granulicollis*, p. 41, Tondano, *atomaria*, Singapore, *vitiosa*, Waigiou, *terrena*, Menado, p. 41, *irrorata*, p. 42, Saylee.

Pelephicus, p. 42. Sides of prothorax suddenly deflected posteriorly; differs from *Odosyllis* also in the cylindrical form of the club, and longer pectoral canal, which is nearly open at the apex. *P. stigmaticus*, ibid. Saylee.

Berosiris, p. 43. Differs from *Cyamobolus* in its clavate femora being armed with a large angular tooth; nearer *Nechyrus* and *Macromerus*. *C. marci*, Boh., and *B. picticollis*, ibid. pl. i. fig. 9, *cribratus*, p. 44, Sarawak, *violatus*, Java, *hepaticus*, Tondano, *devotus*, Goram, p. 44.

Pachyonyx araneosus, p. 34, Cochin China.

Ocladius barani, p. 35, Syria.

Cyamobolus bicinctus, p. 36, Malacca, *subsellatus*, ibid. pl. i. fig. 12, *duplicatus*, p. 37, Saylee.

Orochlesis maculosa, p. 40, Salwatty.

Nedymia geminata, p. 43, Batchian.

The same author, Ann. N. H. (4) xiii., also describes the following new genera and species:—

Psydestis, p. 412. Allied to *Melanterius*, but with a short, stout, ro-

trum, no ocular lobes, and a short 2nd segment to the abdomen. Also with affinities to *Diethusa*, *Emide*, and *Lybæba*, now associated with *Melanterius* by the author. *P. affluens*, *ibid.* W. Australia.

Scolyphrus, p. 413. Differs from *Poropterus* in its narrow tarsi, and from *Agenopus* by the 3rd basal segment of abdomen being not nearly so large as the 1st and 2nd. *S. obesus*, *ibid.* Queensland.

Euoropis, p. 418. Differs from *Acalles* in its tibiæ being toothed outwardly near the base. *E. castanea*, *ibid.* Swan River.

Embaphiodes, p. 419. *Tylodes* group; with no obvious allies; the epipleura forming the largest part of each elytron. *E. pyxidatus*, *ibid.* Lord Howe Island.

Poropterus tetricus, p. 412, Gayndah.

Petosiris annulipes, p. 413, N. S. Wales.

Drassicus infaustus, p. 414, Queensland.

Imaliodes scrofa, *ibid.* Albany.

Acalles delirus, p. 415, *nucleatus*, *distans*, *cribricollis*, *bisignatus*, p. 416, *perditus*, *memnonius*, *foraminosus*, p. 417, *expletus*, p. 418, Australia.

Crypharis longicollis, sp. n., H. Tournier, Bull. Soc. Ent. Fr. (5) iv. p. ccx. Biskra.

Isorhynchides.

F. P. Pascoe, J. L. S. xii., describes the following new genera and species:—

Brephiope, p. 46. "Affinities not very obvious." *B. castanea*, *ibid.* Sula, Ceram.

Metetra, *ibid.* Agrees with *Lobotrachelus* in the scutellar prolongations of prothorax, but with shorter legs and the prothorax proportionately larger. *M. suturalis*, p. 47, Waigiou.

Othippia, p. 49. No affinities suggested. *O. distigma*, *jubata*, *proletaria*, Sarawak, *funnebris*, Ceram, p. 50, *podagrica*, p. 51, Mysol.

Egiona, p. 51. Differs from *Othippia* in the rounded base of its rostrum, the unthickened basal joint of its funiculus, free pygidium, and less elongate femora. *E. lata*, *ibid.* pl. iii. fig. 2, Macassar.

Pseniclea, *ibid.* Pectus short, bringing the rostrum directly against the anterior coxæ; eyes almost frontal. "Affinities not very evident." *P. puellaris*, p. 52, Dorey.

Panigena, p. 52. No affinities suggested. *P. chalybea*, *violacea*, Batchian, *cyanoptera*, Saylee, *pedestris*, Mysol, p. 53.

Cebrius, p. 54. Differs from *Panigena* in not having the tibiæ spurred. *C. luteicornis*, *ibid.* pl. iii. fig. 3, Mysol, Waigiou.

Lissoglena, *ibid.* Differs from *Panigena* in the pectoral canal being continued between the anterior coxæ, and the larger and longer first joint of the funiculus. *L. picipennis*, p. 55, Sumatra.

Lobotrachelus stigma, p. 44, Australia, *plagiatus*, Flores, *luteus* and *albirostris*, Macassar, p. 45.

Telephæ (removed to this group) *strigilatu*, p. 47, *concreta*, *luctuosa*, *metata*, p. 48, Batchian, *denticollis*, p. 48, Dorey, *repetita*, *selligera*, p. 49, Sarawak.

Ceuthorhynchides.

Ceuthorhynchus contractus, var. ? *pallipes*, Crotch. Retaken in Lundy Island, N. Devon, and fresh characters suggested; F. Smith, Ent. M. M. xi. p. 111.

Baridiides.

Baridius tenuirostris, H. Bris., = *Eumycterus albo-squamulatus*, Boh.; E. Abeille, Bull. Soc. Ent. Fr. (5) iv. p. cccxxv.

F. P. Pascoe, J. L. S. xii., describes the following new genera and species:—

Metanthia, p. 57. Differs from *Ipsichora* in its approximate coxæ, thick rostrum, and short stout scape. *M. pyritosa*, pl. iii. fig. 4, Dorey, Saylee, *ebenina*, Batchian, p. 57, *cyanea*, Waigiou, *nitidula*, Batchian, p. 58.

Ipsichora, p. 58. Rostrum as in *Pseudocholus*, but with shorter legs, and femora stouter and canaliculate beneath; colour blue. *I. cupido*, ibid. Ceram, *cælestis*, Dorey, *pulchella*, Salwatty, *femorata*, Aru, p. 59.

Myctides, p. 59. No affinities suggested. *M. barbatus*, p. 60, Batchian.

Cynethia, p. 60. Allied to *Myctides*, but with the rostrum dilated at the apex, scrobes commencing behind the middle, elytra flat along the suture, &c. *C. interrupta*, p. 61, pl. iii. fig. 12, Sumatra.

Acythopeus, p. 61. Near *Myctides*, but with rostrum very much curved and thickened at the base, and the femora entire beneath. *A. tristis*, pl. iii. fig. 11, New Guinea, *tenuirostris*, Tondano, *palmaris*, Amboina, *curvirostris*, Gilolo, p. 62, *bigeminatus*, p. 63, Batchian.

Laodia, p. 63. Differs from *Myctides* in the dilated apex of rostrum, the eye not being in contact with the prothorax, the small claw-joint, &c. *L. niveo-picta*, ibid. pl. iii. fig. 8, Macassar, *niveo-sparsa*, p. 64, Amboina.

Lystrus, p. 64. Near *Madopteris*, but of trapezoidal form. *L. sculptipennis*, ibid. pl. iii. fig. 1, Singapore, Macassar.

Simocopsis, p. 65. Like *Elasmorhinus*, Lac., but with free claws. *S. umbrinus*, ibid. pl. iii. fig. 10, Brazil?

Pseudocholus (char. emend.) *basalis*, Gilolo, *orichalceus*, Bouru, *cinctus*, Saylee, p. 56.

Baridius aterrimus, sp. n., C. O. Waterhouse, Ent. M. M. x. p. 226, Singapore (destroys orchids).

Calandrides.

F. P. Pascoe, J. L. S. xii., describes the following new genera and species:—

Prodiocetes, p. 66. Allied to *Megaproctus*, but with an elongate scape, the elytra wider than the prothorax, and the femora more clavate, the posterior being shorter. *Sphenophorus dehaani*, Gyl., and *P. quinarius*, pl. iv. fig. 2, Borneo, *pavoninus*, Sarawak, p. 67.

Tyndides, p. 68. Differs from *Prodiocetes* in its slender, straight rostrum, and sublinear femora. *T. pustulosus*, pl. iv. fig. 4, Sumatra, Malacca, *lineatus*, Sarawak, ibid.

Zetheus, p. 69. Differs from *Megaproctus* in its scrobes being basal elytra parallel, and femora elongate and very slender. *Z. electilis*, ibid. pl. iv. fig. 1, Penang.

Periphemus, ibid. Of cylindrical form; the rostrum short and slender, with basal scrobes, and the spongy part of the antennal club concealed. *P. retrorsus*, ibid. pl. iv. fig. 3, Sarawak, *superciliaris*, Sumatra, *deletus*, Cochin China, Laos, p. 70.

Diathetes, p. 71. Agrees with *Barystethus*, except in the less produced scutellar prothoracic lobe, sulcate or lineate-punctate tibiae, and metasternum continuous with the mesosternum. *D. ruficollis*, pl. iv. fig. 7, Waigiou, *sannio* and *strenuus*, Aru, *nitidicollis*, Amboina, p. 72, *morio*, p. 73, Australia, Cape York.

Autonopsis, p. 75. Habit of the South American *Litosomus*. *A. lineata*, ibid. pl. iv. fig. 10, Malacca, Sumatra.

Laogenia, ibid. For the present, near *Calandra*. *L. sorex*, pl. iv. fig. 11, Gilolo, Sarawak, *intrusa*, Tondano, Sarawak, p. 76.

Megaproctus pugionatus, p. 68, Tondano.

Poteriophorus congestus, p. 70, pl. iv. fig. 9, Malacca.

Barystethus ater, p. 71, Dorey.

Cercidocerus indicator, p. 73, *effetus*, p. 74, Singapore, *hispidulus*, pl. iv. fig. 5, p. 73, *saturatus*, p. 74, Penang, *nervosus*, p. 74, pl. iv. fig. 6, Java.

Sipalides.

Rhina (?) *frontalis*, sp. n., J. L. Leconte, Tr. Am. Ent. Soc. v. p. 70, Mojave Desert, California.

Cossonides.

Eutornus dubius, Woll., re-characterized, and *Pentarthrum zealandicum*, W., var. n. *canaliculatum*, from New Zealand. T. V. Wollaston, Cist. Ent. pt. viii. pp. 207 & 208.

Mesoxenophasis, g. n., *id. l. c.* p. 199. Very like *Micotribus*, but with a conspicuous scutellum, quite sunken eyes, &c.; differs from *Sericotrogus* in its sub-approximate eyes, &c. *M. brouni*, sp. n., *id. l. c.* p. 200, New Zealand.

Pentarthrum sharpianum, sp. n., *id.* Ent. M. M. xi. p. 149, New Zealand.

Tychiodes jansoni, sp. n., *id.* Cist. Ent. pt. viii. p. 201, Philippine Islands.

Himatium variolosum, sp. n., *id. l. c.* p. 202, Cape of Good Hope.

Brachyscapus ? *angolensis*, sp. n., *id.* Ent. M. M. xi. p. 150, Angola.

Phlaeophagosoma thoracicum, p. 203, *dilutum*, *pedatum*, p. 204, New Zealand, *id.* Cist. Ent. pt. viii., spp. nn.

Borophloeus murrayi, sp. n., *id. l. c.* p. 205, California.

Eutornus congener, sp. n., *id. l. c.* p. 206, Malacca.

SCOLYTIDÆ.

Hylurgus piniperda, *Tomicus stenographus* and *nigritus* from England (? introduced); E. C. Rye, Ent. M. M. p. x. 205. *Drycetes alni*, Georg, ? = *Bostrichus bulmerincqii*, Kolen.; *id. tom. cit.* p. 229.

Cryphalus carinulatus, p. 70, *puncticollis*, *digestus*, p. 71, spp. nn., J. L. Leconte, Tr. Am. Ent. Soc. v. California.

Xyleborus vicinus, British Columbia, *hamatus*, California, *id. l. c.* p. 72, spp. nn.

Tomicus latidens, sp. n., *id. l. c.* p. 72, California.

Scolytus amygdali, Guér., and var. *rufipennis*, from Trieste, described; K. Brancsik, B. E. Z. xviii. p. 135.

BRENTHIDÆ.

Eupsalis minuta, Drury. Habits and transformations described and figured; C. V. Riley, Rep. Ins. Mo. vi. pp. 113-117, fig. 31.

ANTHRIBIDÆ.

The 14th article of the 'Énumération des nouvelles espèces de Coléoptères rapportés de ses Voyages' is published after his death in the name of the late Victor Motschoulsky (Bull. Mosc. xlviii. pt. 2, pp. 226-242), and relates exclusively to this group, in which *Mycterus* is included. In tables of *Cyclops*, *Urodon* (also included), *Alticopus*, and *Brachytarsus*, various species are attributed to the author with no indications of novelty.

The following new genera and species are characterized:—

Macrotrichius, p. 231. Form of *Phlaeotragus*, with rostrum and antennæ of *Mecocerus*. *Macr. scabratus*, Sonda Isles, *niveinasus*, North Australia, p. 232.

Pachygenia, p. 233. Form of *Mecocerus*. *P. guttulata*, Sumatra, *im-pluviata*, ? E. India, p. 234.

Anthrimecus, p. 238. After *Anthribus*, with the elytral fascicles elongated and a little elevated. *A. alternans*, p. 239, Brazil.

Phænisor, p. 240. Of the cylindrical form of *Polycorynus*, but shorter. *P. albo-fasciatus*, p. 241, Central America.

Rhinanthribus, p. 241. Of the attenuate form of *Acorynus*, but even narrower. The rostrum is very long, cylindrical, and arched, constituting a passage to the *Apoderides*; but from other characters the genus is placed near *Polycorynus*. *R. dispar*, p. 242, Sonda Isles.

Eucorynus variolosus, p. 231, Siam.

Eugonus orientalis, *ibid.*, E. India.

Acorynus anthriboides, p. 234, Sumatra.

Stenocerus variegatus, *ibid.*, Nicaragua.

Gymnognathus nebulosus, p. 235, Brazil.

Tropideres neglectus, Cape of Good Hope, *lateralis*, E. Indies, p. 235.

Cratoparis tessellatus, E. India, *ferruginosus*, Brazil, *fusco-maculatus*, Panama, p. 236.

Xylinades tuberculosus, *ibid.*, Natal.

Xenocerus olivaceus, New Guinea, *albitriangularis* and *seminiveus*, Sonda Isles, p. 237, *leucogrammus*, p. 238, North Australia.

Phæniton nodosus, p. 239, Surinam, *philipp[en]ensis*, p. 240, Philippine Isles.

Aræocerus coffeæ attacking peaches in Louisiana ; T. Glover, Rep. Comm. Agricult. 1872, p. 114, fig. 3.

Zygænodes monstrosus, Pasc. ; J. O. Westwood, Thesaurus ent. oxon. p. 205, pl. v. fig. 4.

Zygænodes diopsideus, sp. n., *id. ibid.* fig. 5, Borneo.

BRUCHIDÆ.

Bruchus irresectus, F., from Toulon ; economy described. E. Perris, Nouv. et faits (2), Nos. 3 & 4, pp. 9-16.

Bruchus lentis, pisi, and *granarius*. The exact amount and the nature of the parts of seeds eaten by the larvæ of these species, described and tabulated by P. Stefanelli, Bull. Ent. Ital. vi. pp. 124-129.

AGLYCYDERIDÆ.

Aglycyderes setifer, Westw., redescribed and figured ; J. O. Westwood, l. c. p. 106, pl. v. fig. 3.

CERAMBYCIDÆ.

H. W. BATES, Tr. E. Soc. 1874, pp. 219-235, in a "Supplement to the Longicorn Coleoptera of Chontales, Nicaragua," re-characterizes new genera and species taken by Mr. Belt, raising the total number of that gentleman's captures to 309 species [Zool. Rec. ix. p. 299].

The same author, Ann. N. H. (4) xiv. pp. 16-24, 118-131, describes 57 species from New Zealand. Of the 35 genera, 26 are peculiar to the islands, as are all the species, except 4, evidently introduced (3 from Australia, and *Hylotrypes bajulus* from Europe).

As to larvæ of Longicorns never attacking decayed wood ; P. E. Soc. 1874, p. x. Instances to the contrary ; J. Gardner, Ent. M. M. xi. p. 135.

Prionides.

Cantharocnemis livingstonii, Westw., fig. x. p. 106, *Cantharoctenus burchelli*, Westw., fig. 8, *Cantharoplatys felderi*, Westw., fig. 9, p. 107, redescribed and figured ; J. O. Westwood, Thesaurus ent. oxon. pl. ii.

Prionus lævigatus, Harris, *obliquicornis*, Lec., = *pocularis*, Dalm. ; *P. innocuus*, Lec., = *emarginatus*, Say, ♀ ; *Mallodon mandibularis*, Gemm., is a *Nothopleurus* ; *M. costulatus*, Lec., = *dasystemus*, Say ; *M. cilipes*, Say, = *melanopus*, L. ; G. R. Crotch, C. H. xii. p. 91.

Acanthophorus palinii, Hope, is a *Tithoes*, and quite distinct from *yolofus*, Dalm. ; *A. capensis*, White, is not a *Tithoes* ; *Mallodon gnatho*, Wh., is a *Nothopleurus* ; *Sarmyds antennatus*, Pasc., = *Tragosoma subcoriaceum*, Hope, ♂. C. O. Waterhouse, P. E. Soc. 1874, p. xxviii.

Psolidognathus boucardi, sp. n., J. Thomson, Pet. Nouv. vi. p. 427, Panama.

Acanthophorus hahni, sp. n., C. A. Dohrn, S. E. Z. xxxv. pp. 423-427, S. W. Africa.

Cerambycides.

Spondylis laticeps, Lec., = *upiformis*, Mann.; *Asemum juvenum*, Hald., = *mæstum*, Hald., var.; *A. asperum*, Lec., is a *Notorhina*; *Æme linearis*, Harr., = *rigida*, Say; *Hypermallus dubius*, Lec., = *truncatus*, Hald.; *H. neglectus*, Lec., *vicinus*, Hald., = *incertus*, Newm.; *H. oblitus*, Lec., = *parallelus*, Newm.; *H. operarius*, White, = *simplicicollis*, Hald.; *Curius scambus*, Newm., = *dentipes*, Ol.; *C. concinnatus*, Hald., = *dentatus*, Newm.; *Anoplium pubescens*, Hald., is a *Stromatium*; *Gracilia fusca*, Hald., = *minuta*, F.; *Stenocorus lineatus*, Ol., = *inquisitor*, F.; *Pachyta fulvipennis*, Mann., and *Leptura semimarginata*, Rand., = *Acmæops pratensis*, Laich.; *P. instabilis* and *rufula*, Hald., and *Gaurotes chalybea*, Hald., are to be referred to *Leptura*; *Pachyta vexatrix*, Mann., = *6-maculata*, L.; *Acmæops californica*, *fusca*, *lugens*, *viola*, *mollispilla*, and *subcyanea*, Lec., = *tumida*, Lec.; *A. dorsalis* and *lupina*, Lec., = *subpilosa*, Lec.; *A. fusciceps*, *nigripennis*, and *varians*, Lec., = *3-vittata*, Say; *A. gibbula*, Lec., = *proteus*, Kby., var.; *Anthophylax venustus*, Bland, = *mirificus*, ♀; *Leptura atro-vittata*, Bl., = *abdominalis*, Hald.; *L. auripilis*, Lec., = *chrysocoma*, Kby.; *L. allecta*, Newm., = *sphæricollis*, Say; *L. carolina*, Web., = *zebrata*, F.; *L. bivittata*, Say, is an *Acmæops*; *L. cinnamoptera*, Hald., *cribripennis*, Lec., = *canadensis*, var.; *L. coarctata*, Hald., = *scalaris*, Say; *L. convexa*, Lec., = *instabilis*, Hald., var.; *L. elegans*, Hald., = *subhamata*, Rand., var.; *L. fasciventris*, Lec., = *crassipes*, Lec.; *L. gulosa*, K., = *semivittata*, K.; *L. indirecta*, Newm., *lateralis*, Lec., = *lineola*, Say; *L. lugens*, Lec., = *latifusa*, Lec.; *L. militaris*, Chev., = *molybdica*, Lec.; *L. nobilis*, Newm., = *velutina*, Ol.; *L. quagga*, Germ., = *zebra*, Ol.; *L. rufibasis*, Lec., = *similis*, K.; *L. vitiosa*, Lec., = *obliterata*, Hald.; *L. xanthogastra*, Lec., = *crassipes*, Lec.; *Strangalia obsoleta*, Hald., = *famelica*, Newm.; *S. unicolor*, Hald., = *acuminata*, Ol.; *Desmocerus elongatus*, Bland, = *palliatu*, Forst.; *Glaphyra*, Newm., = *Molorchus*; *Callidium mannerheimi*, Lec., = *dimidiatum*, K.; *Euryoptera sanguinicollis*, Horn, is a *Rhopalopus*; *Clytus agrestis*, Lec., = *colonus*, F.; *Tillomorpha pini*, Ol., is a *Eudermes*; G. R. Crotch, C. H. xii. pp. 91-93.

Sophron eburatus, Pasc., is an *Eburophora*, which should be placed next to *Sophron*, Newm.; *Trichozys flexus*, Chev., = *Clytus melanotelus*, White; *Anthobocus figuratus*, Pasc., = *Clytanthus marginalis*, Chev., and *A. leucothyreus*, Pasc., = *C. austerus*, Chev. (exx. typ.); *C. oppositus*, Chev., = *Clytus signaticollis*, Lap. & G.; *Clytus protogenes*, Newm., is an *Acrocyrta*; *Xylotrechus fumelicus*, Pasc., is from Borneo; *Clytus dominula*, White, is a *Xylotrechus*; *C. subcruciatu*, Wh., is a *Calanthemis*; *C. phidias*, Newm., is distinct from *X. australis*, L. & G.; *C. mouhoti*, Pasc., = *semiluctuosus*, White; *Eriphus leucogrammus*, Wh., = *Pæciloderma lineolatum*, Wh.; C. O. Waterhouse, P. E. Soc. 1874, pp. xxviii. & xxix.

Taurotagus kingi, Lac., ♀ described; C. A. Dohrn, S. E. Z. xxxv. p. 422.

Leptura rufa, var., with black spotted elytra, from Madrid; Martinez-Saez, Act. Soc. Esp. iii. p. 67.

Clytus cinereus, Gory. Kraatz objects to his *C. sterni* being identified with this species; Bull. Soc. Ent. Fr. (5) iv. p. xxxvi.

Vesperus strepens. Habits of ♀ at Nice; G. Tappes, Pet. Nouv. vi. p. 438, and Peragallo, tom. cit. p. 439. This species and *V. xatarti* and *luridus* undergo their transformations underground, and the larvæ live on roots; V. Mayet, tom. cit. p. 447.

New genera and species :—

Demelius, C. O. Waterhouse, Ent. M. M. xi. p. 127. *Phoracanthides*; allied to *Orion*. *D. semirugosus*, id. *ibid.*, Queensland.

Liogramma, H. W. Bates, Ann. N. H. (4) xiv. p. 18. Near *Phacodes* and *Elaphidium*, but with 3rd joint of antennæ sharply produced inside at the apex, and the rest simple. *Callidium zealandicum*, Blanch.

Leptachrous, id. l. c. p. 19. Near *Phlyctænodes*, but with a quadrate head, which is more elongate before the eyes, and slender filiform palpi. *Cerambyx strigipennis*, Westw.

Astetholea, id. l. c. p. 20. Nearest *Tricheops*, but with the head nearly plane between the antennæ, and the antenniferous tubers almost horizontal, with a continuous impressed dorsal line. *A. pauper*, id. l. c. p. 21, Auckland, New Zealand.

Gastrosarus, id. l. c. p. 22. Nearest *Callimis* and *Earinis*. *G. nigricollis*, id. l. c. p. 23, New Zealand.

Cleozona, id. Tr. E. Soc. 1874, p. 223. *Tillomorphina*; near *Euderes* and *Tillomorpha*, but with slender, grooved, and spined antennæ, and carinated tibiae. *C. pulchra*, id. *ibid.*, Nicaragua.

Leptalia, G. R. Crotch, C. H. xii. p. 93. Not characterized: type, *Leptura fuscicollis*, Say, = *Anoplodera frankenhæuseri*, = *macilenta*, Mann. [characterized by Leconte, Sm. Misc. Coll. 264, p. 204: Zool. Rec. x. p. 326].

Gonocallus, Crotch, *ibid.* Not characterized: type, *Callidium lepidum*, Lec., = *collare*, Kby. [Leconte, l. c. p. 171: Zool. Rec. x. p. 325.]

Hypermallus dædaleus, H. W. Bates, Tr. E. Soc. 1874, p. 219, Nicaragua.

Eburodacrys sticticollis, id. l. c. p. 220, Nicaragua.

Nephalus nigriventris, id. *ibid.*, Nicaragua and Mexico.

Alcyopsis chalcea, id. l. c. p. 221, Nicaragua.

Heterachthes obtusus, id. *ibid.*, Nicaragua.

Didymocantha picta, id. Ann. N. H. (4) xiv. p. 18, New Zealand.

Hybodera debilis, Leconte, Tr. Am. Ent. Soc. v. p. 66, California (probably = *tuberculata*, Lec.).

Toxotus virgatus, id. l. c. p. 67, Oregon, Vancouver, British Columbia.

Pachyta excellens, K. Brancsik, B. E. Z. xviii. p. 230, Hungary.

Strangalia delicata, Leconte, l. c. p. 68, California.

Leptura rhodopus, id. *ibid.*, California.

Callichroma opiparum, Bates, l. c. p. 222, Nicaragua.

Phymatodes nitidus, Leconte, l. c. p. 66, California.

Platynotus moei, C. G. Thomson, Opusc. Ent. (vi.) p. 552, Norway.

Xylotrechus planifrons, Leconte, l. c. p. 67, California.

Lamiides.

Xylotoles westwoodi, Guér., *lentus*, Newm., *Lamia heteromorpha*, Boisd., = *X. griseus*, F.; *Somatidia*, Thoms., re-characterized; affinities suggested for *Diastamerus* and *Tympanopalpus*; *Dorcadida bilocularis*, White, is from Tasmania; *Hesperophanes unicolor*, F., is from Amsterdam Island, and belongs to *Ceresium* or *Diatomocephala*. H. W. Bates, Ann. N. H. (4) xiv. pp. 118-131.

Anthores leuconotus, Pasc., destroying coffee plantations at Natal; P. E. Soc. 1874, pp. ii., vii., xiv.-xvi.

Astynomus œdilis. Note on large numbers taken at Hartlepool, introduced from France; Ent. Ann. 1874, p. 55.

Ezocentrus claræ, Muls., = *punctipennis*, Muls., var.; M. des Gozis, Bull. Soc. Ent. Fr. (5) iv. p. cccxxxix.

Saperda mæsta, Lec., larva and pupa described by W. Saunders, Canad. Ent. vi. pp. 61-63. *S. bivittata*; habits and remedies; Nat. Canad. ii. pp. 351-355.

New genera and species :—

Microlamia, H. W. Bates, Ann. N. H. (4) xiv. p. 123. Near *Xylotoles*, but joints of antennæ short, the first not suddenly dilated externally at the base, and femora strongly tumido-clavate. *M. pygmæa*, id. *ibid.*, New Zealand.

Stenellipsis, id. l. c. p. 124. Allied to *Xylotoles*, but with the facies of *Driopea*. *X. bimaculatus* and ? *X. gracilis*, White, and *S. latipennis*, id. l. c. p. 125, New Zealand.

Psilocnæa, id. l. c. p. 125. Near *Xylotoles*, but with a linear body and the metasternum not abbreviated. *P. linearis*, id. l. c. p. 126, New Zealand.

Spilotrogia, id. l. c. p. 126. Of the same group as *Stenellipsis*, but with the mesosternum between the coxæ nearly as narrow as the prosternum, and the thorax and elytra cylindrical. *S. maculata*, id. *ibid.*, New Zealand.

Eurychæna, id. l. c. p. 127. Of same group as *Enicodes*, but with different facies, the elytra of ♂ not prolonged, and the pro- and mesosterna narrow. *E. fragilis* and *feredayi*, id. *ibid.*, New Zealand.

Hybolasius, id. l. c. p. 128. Near *Hebesecis*, differing chiefly in the shorter and more regularly clavate scape. Also near *Ectropsis*. *Lamia cristata*, F., and *Hyb. viridescens*, *ibid.*, and *simplex*, p. 129, id. l. c. New Zealand.

Pæcilippe, id. l. c. p. 129. Like *Nicippe* and *Disterna*, but with antennæ not approximate at the base, the intermediate acetabula almost closed, and the elytra rounded at the apex. *P. stictica*, id. l. c. p. 130, New Zealand.

Cymatonycha, id. Tr. E. Soc. 1874, p. 234. Links the *Estolinae*, *Gryllicinae*, and *Hebestolinae*, and probably indicates the true point of transition from the *Lamia* to the *Saperda* type. *C. castanea*, id. *ibid.*, Nicaragua.

Hoplotoma, sub-g. of *Phytæcia*. L. Perez Arcas, An. Soc. Esp. iii. p. 151. First abdominal segments armed with a strong tooth. Type,

Phytæcia bolivari, id. l. c. p. 149, Madrid, pl. iii. fig. 5 (? = *malachitica*, Luc., the ♂ of which has a dentiform tubercle at the apex of the 2 first abdominal segments, and traces of tubercles on the 3rd and 4th segments. The proposed new sub-genus is considered not natural, being founded on a sexual character, which exists in *Phytæcia* and *Opsilia*. Puton, Bull. Soc. Ent. Fr. 5, iv. p. ccxlix.).

Xylotoles humeratus, p. 119, *nudus*, *rugicollis*, p. 120, *nanus* (? = *parvulus*, White), *ægrotus*, p. 121, *pulchellus*, *scissicauda*, p. 122, H. W. Bates, Ann. N. H. (4) xiv. New Zealand.

Somatidia ptinoides, id. l. c. p. 124, New Zealand.

Dorcadion martinezi, L. Perez Arcas, l. c. p. 145, pl. ii. figs. 5 & 6, Madrid.

Hammoderus nitidus, pp. 224, Nicaragua, *sticticus*, p. 225, note, Ecuador, H. W. Bates, Tr. E. Soc. 1874.

Tautoclina scissicauda, id. l. c. p. 225, Nicaragua.

Desmiphora canescens, Nicaragua, *pallida*, Jamaica (note), id. l. c. p. 226.

Estola vittulata, id. l. c. p. 226, Nicaragua.

Trestonia assulina, id. *ibid.*, Chontales, and ? Brazil.

Hoplistocerus gemmatus, id. l. c. p. 227, Nicaragua.

Oreodera obsoleta and *semialba*, id. l. c. p. 228, Nicaragua.

Leptostylus palliatus, *hispidulus*, p. 229, *cineraceus*, p. 230, Nicaragua, *gibbulosus*, p. 230, note, Venezuela, id. l. c.

Lepturges 6-vittatus, p. 230, *tigrellus*, *gratiosus*, p. 231, id. l. c. Nicaragua.

Phæa mirabilis, id. l. c. p. 232, Nicaragua.

Isomerida lineata, id. l. c. p. 232, Chontales, and var. from New Granada.

Evana (wrongly placed by Lacordaire in the *Ærenicites*, as its head is retractile) *pusilla*, id. l. c. p. 233, Nicaragua, and var. from Mexico.

Eumathes cuprascens, id. l. c. p. 233, Nicaragua.

Oberea quadricallousa, J. L. Leconte, Tr. Am. Ent. Soc. v. p. 68, W. California, Nevada.

CHRYSOMELIDÆ.

The 10th vol. of the "Genera des Coléoptères," unfinished at the death of Lacordaire, and commencing the "Famille des Phytophages" of that author's work, has been published under the supervision of F. Chapuis. Paris: 1874, pp. i.-iv. 1-455. The sections employed are—I. EUPODES, tribes *Sagrides*, *Donacides*, *Criocerides*; II. CAMPTOSOMES, tribes *Mégascélides*, *Mégelopides*, *Clytrides* [see Zool. Rec. ix. p. 310, for derivation of *Clithra*], *Cryptocéphalides*, *Chlamydes*, *Sphærocharides* [*Sphæro*-]; III. CYCLIQUES, tribes *Lamprosomides*, *Eumolpides*, *Chrysomélides* (with which the present volume terminates), *Galérucides*; IV. CRYPTOSOMES, tribes *Hispides*, *Cassidides*. Various sub-divisions of these groups are proposed; and many new genera characterized (especially in the *Eumolpides*), new species being very curtly diagnosed in the foot notes. An enumeration of known species of each genus mentioned is no longer given, as in former volumes.

The work is reviewed in R. Z. (3) ii. pp. xxxviii.-xl. and Pet. Nouv. vi. p. 413 (the accompanying plates, not seen by the Recorder, being stated to be bad. In the latter publication, rectifications of errors in the names of the species figured are given, p. 414).

J. S. BALY's "Catalogue of the Phytophagous Coleoptera of Japan, with descriptions of the species new to science," is continued. Tr. E. Soc. 1874, pp. 161-217 [Zool. Rec. x. p. 331].

Sagrides.

The following groups are employed by Lacordaire and Chapuis, Gen. Col. x. p. 30:—*Mégamérites*, *Carpophagites*, *Sagrites*, *Mécynodérites*, *Amétallites*, *Orsodacnites*, *Rhabites*, and *Aulascémites*. *Polyoptilus lacordairii* and *erichsoni*, Germ., are very probably ♂ & ♀ of one species. A new species of *Aulascémis*, from Guatemala, is briefly diagnosed under the name *candezii*, p. 55.

Sagra splendida, F. (1801), Lucas, = *purpurea*, Licht. (1795); E. v. Harold, C. H. xii. p. 100.

Donaciides.

Hamonia zosteræ, Lac., *schiedtii*, Guér., = *ruppiæ*, Germ.; J. C. Schiödt, Nat. Tids. (3) viii. p. 117.

Oriocerides.

Zeugophora subspinosa, var. *b*, Paykull, is probably *Z. turneri*, Power; Kraatz, B. E. Z. xviii. p. 446.

Lema cyanella, F., nec L. (*puncticollis*, Curt.), re-named *insignis*; F. Bruggemann, Abh. Ver. Brem. iii. p. 515. *Lichenis*, Voet, is a still earlier name; E. v. Harold, C. H. xii. p. 147.

Lema intermedia, Suffr., nec Lac., re-named *gundlachiana*; Suffrian, C. H. xii. p. 152.

Zeugophora californica, sp. n., G. R. Crotch, Tr. Am. Ent. Soc. v. p. 78, Oregon.

Clithrides.

Coscinoptera dominicana, F. Habits in connection with the Sumach tree, and transformations, described and figured; C. V. Riley, Rep. Ins. Mo. vi. pp. 127-131, fig. 36.

Labidostomis leithneri, sp. n., L. Redtenbacher, Fauna Austriaca, Col., 3rd. edn. p. 448, Austria.

Babiides.

Clitaspis, g. n., E. v. Harold, C. H. xii. p. 88. Claws split; differs from *Tellenia* in its unequal legs, much longer 4th antennal joint, acute hinder thoracic angles, and the much sinuated sides of its elytra. *Clithra sericata*, Perty (ex. typ.).

Chlamydides.

Hymetes indica, sp. n., F. Chapuis, Gen. Col. x. p. 205, note, 'India.'

Eumolpides.

E. v. Harold, C. H. xii. pp. 53-87, commences "Beiträge zur Kennt-

niss der Amerikanischen Eumolpiden." *Colaspis dimidiata*, Baly, and *gemma*, Pty., are referred to *Chalcophana*; *Eumolpus cerasinus*, Pty., is a *Clisithera*; *Cryptocephalus lineatus*, F., is an *Endocephalus*; *Melina calceata*, Chap., = *Eumolpus tibialis*, Germ. *Nodostoma fulvipes*, Baly, nec Mots., re-named *xanthopus*; id. l. c. p. 152.

Bromius vitis. The larva is subterranean; J. Lichtenstein, Bull. Soc. Ent. Fr. (5) iv. p. lvi.

F. Chapuis, Gen. Col. x., describes the following new genera and species:—

Amasis, p. 236. 'Iphiméites': differs from *Chrysolampra*, Baly, in its strongly mucronated posterior tibiae. *A. calcaratus*, p. 237, note, Rio Janeiro.

Agrianes, p. 238. Allied to *Clisithera*, Baly; antennae distinctly more slender at base and apex than in the middle; epistoma semicircularly emarginate, bidentate. *A. validicornis*, p. 239, note, Brazil.

Alphites, p. 239. Last joint of maxillary palpi inflated, as wide as long. *A. clavipalpus*, p. 240, note, Bahia.

Agbalus, p. 242. Head and thorax pubescent; posterior tibiae mucronated. *A. sericeus*, p. 243, note, Brazil.

Alittus, p. 243. Facies of *Dermorhytis*; differs from *Agbalus* in its non-mucronate posterior tibiae. *A. foveolatus*, ibid., note, Port Denison.

Terillus, ibid. Facies of *Myochrous*; anterior angles of pronotum obtuse, not projecting. *T. rotundicollis*, p. 244, note, King George's Sound.

Teaspes, p. 244. Form of *Bromius vitis*; differs from *Terillus* in its sharply projecting thoracic anterior angles. *T. tessellata*, p. 245, note, Brazil.

Aletes, p. 250. 'Colaspites': near *Colaspis*, but with robust antennae, large eyes, elongate elytra, &c. *A. angulicollis*, p. 251, note, Colombia.

Agetus, p. 252. Not of the facies of *Colaspis* and its allies; more robust, head less free, antennae shorter, with joints 2 and 3 almost alike, and prosternum more like that of *Lepronida*. *A. subcostatus*, ibid., note, Adelaide.

Thasycles, p. 254. Next *Geloptera*, Baly; elytra punctured, and with irregular series of smooth tubercles; prothorax with anterior angles effaced. *T. cordiformis*, p. 255, note, New Caledonia.

Tomyris [Eichw., *Reptilia*], p. 265. 'Tomyrites': antennae long, filiform, prosternum narrow, eyes large and deeply sinuate, 4 posterior tibiae emarginate outwardly. *T. pulchella*, p. 266, note, Sydney.

Irenes, p. 280. 'Leprotites': near *Demotina*, Baly, but with very large reniform and deeply emarginate eyes. *I. manca*, p. 281, note, ? Malasia.

Casmena, p. 284. 'Hétéraspites': femora strongly toothed. *C. murrayi*, ibid. note, Old Calabar.

Nerissus (Dej., characterized) *strigosus* (Murray), p. 286, note, Old Calabar.

Eurytus, p. 289. 'Pseudocolaspites': metasternum very wide, posterior femora widely separated, scutellum triangular. *E. balyi*, p. 290, note, Cape of Good Hope.

Pausiris, p. 290. Facies of *Colaspidea*; thorax sub-globular, *P. rotundicollis*, p. 291, note, Cape of Good Hope.

Pallena, p. 291. Differs from *Eurytus* in its pentagonal scutellum, conical pronotum, and more elongate form. *P. tibialis*, ibid. note, Cape of Good Hope.

Macrocoma, p. 292. With long silky pubescence; differs from *Pseudocolaspis* in its cylindrical form, less feeble femora, and globular pronotum. *M. eriophora*, ibid. note, Natal.

Himera [Duponchel, *Lepidoptera*], ibid. Squamose; form of *Bromius*. *H. squammulosa*, p. 293, note, Caffraria, Lake N'Gami.

Macetes, p. 293. Resembles *Himera*, but more elongate, and with depressed pubescence. *M. albicans*, ibid. note, S. W. Africa.

Enipeus, p. 294. Facies of *Corynodes*; anterior femora toothed. *E. murrayi*, p. 295, note, Old Calabar.

Edusina, sub-g. of *Edusa*, Chevr., p. 309, for *E. puberula*, Boh.

Edusella, sub-g. of *Edusa*, ibid., for *E. suturalis*, note (no locality mentioned).

Abirus, p. 310. Closely allied to *Dermorhytis*. *Cryptocephalus aeneus*, Wied., and various (unspecified) species of *Dermorhytis*.

Tymnea, ibid. Only distinguishable from *Abirus* by the almost entire absence of transverse rugosities behind the shoulders. *T. verticalis*, p. 311, note, S. America, and ? *Colaspis longicornis*, Mels.

Olorus, p. 311. Differs from *Edusa* in the want of pubescence, the elytral punctuation, &c.; hind legs much developed, with appendiculated femora. *O. femoralis*, p. 312, note, Juthia.

Argolis, p. 312. Represents *Edusa* in Brazil; tibiae dilated at the apex, emarginate on the inner side, especially in the front pair. *A. tibialis*, p. 313, note, Brazil.

Amasia (Dej., characterized), p. 313. Oval, attenuate at both extremities, with no pubescence; posterior femora very strongly toothed. *A. spinipes*, p. 314, note, Java.

Heterotrichus, p. 316. 'Myochroites': apical joints of antennæ strongly dilated. *H. balyi*, p. 317, note, Juthia.

Eur[y]aspis, p. 317. Of no salient character; scutellum wider than long, very obtuse behind, with rounded outline. *E. vittatus* [-ta], p. 318, note, E. Indies.

Neocles, p. 320. Differs from *Myochrous* and *Dictyneis* in its oblong prosternum, which is divided into two parts by two deep gutters, converging behind; 3rd joint of antennæ very long. *N. sulcicollis*, p. 321, note, Sydney.

Damasus, p. 321. Form regularly cylindrical; hooks of tarsi bifid. *D. albicans*, p. 322, note, Syria.

Mecistes, p. 322. Near *Pachnephorus*; prosternum subquadrate, with two furrows, antennæ subclavate, femora weak, linear. *M. tarsalis*, p. 323, note, S. Africa.

Syagrus, p. 331. 'Typophorites': of elongate, subparallel form, with subquadrate pronotum and femora strongly toothed beneath. *Typophorus buqueti* (Dej.), p. 332, note.

Menius, pp. 332. All the femora toothed beneath, pronotum concave

and biangular behind, inner and upper margins of eyes surrounded by a deep furrow. *M. lacordairii*, p. 333, note, Old Calabar.

Eurydemus, p. 333. Eyes much developed, reaching the median line.

E. insignis, p. 334, note, Australia.

Phædra [*Phædra*] *rufipes*, p. 236, note, Cayenne.

Lepronota morbillosa, p. 242, note, Brazil.

Trichostola vestita (Dej.), p. 294, note, Bourbon.

Melina calceata (Dej.), p. 346, note, Brazil.

E. v. Harold, C. H. xii., describes the following new genera and species:—

Aracyntha, p. 65. Differs from *Metazyonycha* in the simple sides of the thorax, subdiluted prosternum, shorter legs, larger eyes, and almost unlobed outer claw joint. *Colaspis sturmi*, Dej., = *illustris*, Chev., = *tricolor*, Perty.

Mevania, p. 82. Antennæ widened from 5th joint. Allied to *Clisithera* and *Agrianes*, but with shorter antennæ, and the palpi thicker and sub-truncate at the apex; abdomen approaching the structure of the *Clithrides* and *Cryptocephalides*. *M. kirschi*, *ibid.*, Bogotá.

Chrysodina sulcifrons, *kirschi*, p. 55, Bogotá, *fulgurans*, p. 56, Brazil, *purpurea*, *chapuisi*, p. 57, Columbia.

Iphimeis balyi, p. 58, Brazil, *obscura*, p. 59, St. Catharina.

Noda ænea, p. 59, *erythropus*, p. 60, *vicina*, *festiva*, p. 61, Brazil, *pustulata*, *bogotana*, p. 62, Bogotá.

Lepronota marshalli, St. Catharina, *variolora*, Brazil.

Colaspis interrupta, p. 64, note, Brazil.

Prionodera wagneri, p. 66, Costarica.

Chalcophana versicolor, p. 68, *suavis*, p. 73, *fuscicornis*, p. 74, *bogotana*, p. 78, *seminigra*, p. 80, Bogotá, *parvicollis*, p. 69, *consobrina*, p. 70, *fraternus*, p. 71, *dilecta*, p. 73, *apicalis*, p. 74, *sanguinea*, p. 77, *verecunda*, p. 78, *gemmingeri*, p. 81, Brazil, *terminalis*, p. 71, *mutabilis*, p. 75, *discolor*, p. 77, *violaceipennis*, p. 80, Costarica, *wagneri*, Guatemala, *limbalis*, St. Catharina, p. 72, *cincta* (? Klug), p. 76, *ancora*, p. 78, Mexico, *lutulenta*, p. 79, Columbia, Bogotá.

Endocephalus lefevrii and *fenestratus*, p. 84, Brazil.

Melina suffriani, p. 86, Brazil.

Palesida, g. n., E. v. Harold, B. E. Z. xviii. p. 23. Allied to *Pales*, but sides of thorax not toothed, 2nd antennal joint but slightly shorter than 3rd, prosternum very wide. *P. chapuisi*, sp. n., *id. ibid.*, Fassogl (Blue Nile).

Glyptoscelis varicolor, sp. n., G. R. Crotch, Tr. Am. Ent. Soc. v. p. 79, California.

Xanthonia placida, sp. n., J. S. Baly, Tr. E. Soc. 1874, p. 161, Nagasaki.

Demotina fasciculata, fasciata, p. 162, *decorata*, p. 163, *modesta*, p. 164, spp. nn., *id. l. c.* Nagasaki.

Scelodonta lewisi, sp. n., *id. l. c.* p. 165, Japan and China.

Paria (= *Typophorus*) *variabilis*, Japan and E. Siberia, *robusta*, Nagasaki, spp. nn., *id. l. c.* p. 166.

Nodostoma hirticolle, p. 167, *flavo-pustulatum, pallidulum*, p. 169, Nagasaki, *consimile*, p. 168, Japan and China, spp. nn., *id. l. c.*

Nodina chalcosoma, sp. n., *id. l. c.* p. 170, Japan and China.

Cryptocephalides.

H. v. Kiesenwetter, B. E. Z. xviii. pp. 71-75, discusses the nomenclature of species of this group, especially with reference to Von Harold's former paper on the same subject [Zool. Rec. x. p. 334], and with the idea of opposing alterations in recognized names. Explanation of criticisms on Suffrian's nomenclature; E. v. Harold, C. H. xii. p. 149. *Cryptocephalus amatus*, Baly, *nec* Hald., re-named *inurbanus*; E. v. Harold, *l. c.* p. 152. Already re-named *consalanus*; J. S. Baly, Tr. E. Soc. 1874, p. 217, note.

Chlamydicadmus is substituted for *Lachnabothra*, Saund., on account of the latter being "si difficile" as a name [!]; F. Chapuis, Gen. Col. x. p. 191 [it is written *Lachnabothra* by Saunders, referring probably to the abdominal depressions].

Diandichus, g. n., F. Chapuis, Gen. Col. x. p. 165. *Pachybrachites*. Between *Sternoglossus*, Suffr., and *Scolochrus*, Hald.: thorax rather convex on the disk, and depressed at anterior angles; elytra ample, prosternum strongly contracted between the coxæ, enlarged behind. *D. analis*, sp. n. (indicated only), *id. ibid.*, Australia.

Atropidius, g. n., *id. l. c.* p. 175. *Monachites*. Six last joints of antennæ dilated; pronotum acuminate behind, prosternum bicarinate laterally. *A. improbus*, sp. n., p. 176 (indicated only).

Scaphodius, g. n., *id. l. c.* p. 179. Antennal club 5-jointed, posterior margin of prosternum truncate; allied to *Elaphodes*. *S. comptus*, sp. n., p. 180 (not fully described), New Caledonia, ? = *Cryptocephalus striatocollis*, Montr.

Pleomorphus, g. n., *id. l. c.* p. 182. Club 5-jointed; prosternum oblong; differs from *Prasonotus* in the triangular emargination of the prosternum, differently constructed tarsi, &c. Five species from Australia (*P. putridus* and *histerinus* referred to).

Cryptocephalus nigerrimus, G. R. Crotch, Tr. Am. Ent. Soc. v. p. 78, Oregon; *C. manueli*, G. Tappes, Bull. Soc. Ent. Fr. (5) iv. p. ccl. Savoy (? = *coryli*, ♀, var. *teste auct.*); *C. melanostictus*, L. Fairmaire, Pet. Nouv. vi. p. 389, Batna: spp. nn.

Pachybrachys donneri, p. 78, *circumcinctus*, p. 79, spp. nn., G. R. Crotch, *l. c.* Oregon.

Ghrysomelides.

Colaspidema. European species monographed; E. Lefèvre, Ann. Soc. Ent. Fr. (5) iv. pp. 329-350, pl. vi. Joly's account of the economy and metamorphoses of *C. atrum* is reproduced and illustrated. *C. maculicollis*, Lef., = *atrum*, Ol., immature.

Timarcha tenebricosa, F., *Lina ænea* and *populi*, L., and *20-punctata*, Scop., and *Gonioctena rufipes*, Gyl., recorded from Japan; J. S. Baly, Tr. E. Soc. 1874, p. 171 *et seq.*

Timarcha. The difference in amount or position of the felting on the underside of the 3 first tarsal joints serves to distinguish closely allied species; L. Bedel, Bull. Soc. Ent. Fr. (5) iv. p. lxxviii. Observations on the Spanish species in Fairmaire's monograph; *T. rugipennis*, Per., is distinct from *hispanica*, H.-S., with which *globipennis*, F. & All., is identical: L. Perez Arcas, Act. Soc. Esp. iii. pp. 103-105. *T. pimelioides* and *amethystipes*, Chev., are not specifically identical; *T. gallæciana*, Chev., = *gougeleti*, Fairm., nec *chloropus*, Germ.; A. Chevrolat, Bull. Soc. Ent. Fr. (5) iv. p. cxi. *T. lomnickii*, Mill., *ex. typ.*, = *rugulosa*, H.-S.; Puton, *tom. cit.* p. cclix. This synonymy independently affirmed, with observations on types of other species; L. v. Heyden, Pet. Nouv. vi. p. 392. *Timarcha corynthia*, Fairm. & All., = *gibba*, Hoppe and Hornsch.; *T. scortea*, Germ., should not be referred to *lusitanica*, Ill., there being no such species described by Illiger; E. v. Harold. C. H. xii. pp. 98 & 99.

Xiphomela, Vogel, belongs to the *Byrrhida*, near *Pedilophorus*; E. v. Harold, C. H. xii. p. 93. It is pentamerous, and probably one of the *Dascillides*; F. Chapuis, Gen. Col. x. p. 418, note.

Doryphora 10-lineata. Its progress in Canada, and general history; Nat. Canad. iii. pp. 13-20. Its ravages recorded, the greatest annoyance being in the States north of the Ohio River; T. Glover, Rep. Comm. Agric. 1872, p. 120. It still travels eastward, not a single specimen having been seen west of the dividing ridge (Colorado); the beetle seems quite incapable of spreading rapidly by its own instinct, and was not observed higher than 8000 feet; W. L. Carpenter, in Hayden's Ann. Rep. U. S. Geol. and Geogr. Survey of the Territories, 1873, p. 570. It no longer inspires so much dread as before, but is still extending its range of food plants; C. V. Riley, Rep. Ins. Mo. vi. pp. 11-16. Experiments made by 'Burril,' proving that this insect has no venomous secretion [!], recorded in Pet. Nouv. vi. p. 415. For general accounts, *cf.* P. E. Soc. 1874, p. v.; Bull. Soc. Ent. Fr. (5) iv. p. cxix.; Bull. Soc. L. N. Fr., Nos. 25 & 26; Sci. Goss. 1874, p. 15, figs. 17 & 18; G. Kraatz, B. E. Z. xviii. pp. 151 & 152, pl. i. fig. 2; and "Scientific American," xxx. pp. 306 (fig.) & 383, xxxi. pp. 52 (M. P. Smith) & 309 (E. S. Wicklin). *Leptinotarsa 10-lineata*, Rogers, = *multilineata*, Stål, = *10-lineata*, Say, var.; Kraatz, quoting Von Harold, B. E. Z. xviii. pp. 442-444, with general observations on the synonymy of this and the allied species, and figures of *L. juncta* and *11-lineata*, Stål, p. i. figs. 6 & 5. Larva of *L. multilineata* described by Von Harold, l. c. p. 445.

Chrysomela. The various sub-genera are retained as genera; Stål's 1st division of *Doryphora* is named *Megistomela* (p. 398), and his 4th division is named *Trichomela* (p. 399), these forming sub-genera of *Doryphora*, with *Doryphora* proper (divisions 2, 3, 6, & 7), and *Dorysterna*, Guér. (div. 5). Chapuis, Gen. Col. x.

Chrysomela (Lithoptera) subænea, Mots., nec Suffr., is re-named *consimilis*, p. 172, and *C. æthiops*, Ol., nec F., re-named *provincialis*, p. 152;

E. v. Harold, C. H. xii. *C. bicolor*, F., var. *dolorosa*, Fairm., = *negropunctata*, Reitt., var.; E. Reitter, Verh. z.-b. Wien, xxiv. p. 528. *C. staphylæa*, var., and *C. sanguinolenta*, under stones in the Shetland Isles; T. Blackburn, Ent. M. M. xi. p. 112. *C. venusta* produces larvæ and not eggs; L. Bleuze, Pet. Nouv. vi. p. 435. *C. venusta* ? = *speciosa*, var., and Perroud's observations on the viviparous habits of that species are recalled, with remarks on the structure of the oviduct, &c.; V. Mayet, tom. cit. p. 443.

Gonioctena 6-punctata, Panz., nec F., re-named *fornicata*; F. Brügge-mann, Abh. Ver. Brem. iii. p. 518.

Cyrtonastes, g. n., L. Fairmaire, Ann. Soc. Ent. Fr. (5) iv. p. 42. Near *Cyrtonus*, *Timarcha*, and *Chrysomela*. *C. cænicans*, p. 43, Syria, *phædonoides*, p. 44, Beyrouth, id. l. c., spp. nn.

Metastyla, g. n., Chapuis, l. c. p. 400. Metasternum prolonged in front. *Chrysomela nigro-fasciata*, Stål.

Clidonotus, g. n., id. l. c. p. 414. Metasternum very short, no membranous wings; elytra soldered. *Australica (Stethomela) gibbosa*, Baly.

Chrysomela japonica, sp. n., Baly, l. c. p. 171, Japan, Manchuria.

Plagioderia distincta, sp. n., id. l. c. p. 174, Nagasaki.

Phædon brassicæ, p. 174, *incertum*, p. 175, spp. nn., id. l. c. Nagasaki.

Galerucides.

Galeruca sagittariæ, Gyl., occurs in Japan, p. 178; *Palpozena*, Baly, is re-named *Ænidea*, p. 179; *Melospila*, Baly (1861), = *Gallerucida*, Mots. (1860), but the latter name is not adopted "being the singular of *Gallerucidæ* [!] the name of the family," p. 184 [Motschoulsky's name, whether retained as written by him, or corrected to *Galerucoida*, -ides, or -idea, must of course stand]; *Iphidea*, Baly, is not distinct from *Lyperodes*, Mots. J. S. Baly, Tr. E. Soc. 1874.

Galeruca californiensis injuring elms at Sézanne; H. Lucas, Bull. Soc. Ent. Fr. (5) iv. pp. ccxv. *G. cratægi*; similar observations by Barbat; tom. cit. p. ccxxvii.

Scelolyperus, g. n., G. R. Crotch, Tr. Am. Ent. Soc. v. p. 79. Agrees in all respects with *Lyperus*, but the hind tibiæ are deeply arcuate, and furnished in their basal third with a strong triangular tooth, queried as sexual. *S. tejonicus*, sp. n., id. *ibid.*, California.

Thricolema, g. n., id. *ibid.* "Elongate, nearly parallel, pubescent, eyes small, head not constricted behind, anterior coxæ contiguous, 1st joint of the four anterior tarsi longer than the others, claws simple, epipleuræ of elytra excessively feeble." Placed between the above genus and *Lyperus*; but the author states his inability to fix its position in any of the tribes of *Phytophaga*. *T. anomala*, sp. n., id. l. c., p. 80, Calaveras.

Adorium japonicum, sp. n., Baly, l. c. p. 176, Japan and China.

Galeruca tibialis, p. 176, *annulicornis*, p. 177, *vittaticollis*, *distincta*, p. 178, spp. nn., id. l. c. Japan.

Adimonia miegi, sp. n., L. Perez Arcas, An. Soc. Esp. iii. p. 151, pl. iii. fig. 6, N. Spain.

Ænidea armata, p. 179, *ornata*, p. 180, (*Æ.* ?) *basalis*, p. 181, Japan

and China, *Æ. abdominalis*, p. 180, *nigripes*, p. 182, Japan, spp. nn., Baly, l. c.

Cneorane (tibiæ unarmed at apex) *elegans*, sp. n., *id.* l. c. p. 182, Nagasaki.

Arthrotus variabilis, p. 183, *cyaneus*, p. 184, spp. nn., *id.* l. c., Japan.

Melospila consociata, sp. n., *id.* l. c. p. 185, Japan.

Aulacophora 4-plagiata, sp. n., *id.* l. c. p. 186, Nagasaki.

Lyperodes pallidulus, sp. n., *id.* l. c. p. 187, Nagasaki.

Agelastica cærulea (= *alni*, var., Mots.), sp. n., *id.* l. c. p. 188, Yokohama.

Lyperus moorii, *id.* l. c. p. 188, Yokohama; *L. graptoderoideus*, Crotch, l. c. p. 80, Sta. Barbara: spp. nn.

Halticidæ.

Mantura rustica, L., and *Phyllotreta sinuata*, Redt., from Japan; J. S. Baly, Tr. E. Soc. 1874, p. 196.

Blepharida rhois, Forst. Habits and transformations described and figured; C. V. Riley, Rep. Ins. Mo. vi. pp. 118-122, fig. 33.

Lithonoma favieri, sp. n., L. Fairmaire, Pet. Nouv. vi. p. 388, Tangiers (L. v. Heyden, tom. cit. p. 392, Spain).

Edionychis japonicus [-ca], Baly, l. c. p. 189, Nagasaki; *Æ. cribriceps*, *trapezophoros* [-ra], p. 294, 6-punctulata, p. 295, 4-punctata, *basalis*, p. 296, *inconstans*, p. 297, *venustula*, p. 298, 17-guttata, *perforata*, p. 299, *marginicollis*, *elegantissima*, p. 300, *erosa*, p. 301, *labiata*, p. 302, *discipunctata*, p. 303, *albida*, p. 304, 3-plagiata, p. 305, *discicollis*, *punctulata*, p. 306, *humeralis*, p. 307, *austriaca*, p. 308, *perspicillata*, *longicollis*, p. 309, spp. nn., L. Schaufuss, Nunq. Ot. ii. Bogotá: spp. nn.

Graptodera cærulescens, p. 190, *fulvipennis*, p. 193, Japan and China, *viridicyanea*, *picipes*, *angustata*, p. 191, *flavicornis*, p. 192, Japan, Baly, l. c., spp. nn.

Hermæophaga adamsi, sp. n., *id.* l. c. p. 193, Japan.

Sæbæthe flavipennis, sp. n., *id.* l. c. p. 194, Japan.

Liprus hirtus, sp. n., *id.* *ibid.*, Nagasaki.

Crepidodera parvula, *id.* l. c. p. 195, Nagasaki; *C. robusta*, J. L. Leconte, P. Bost. Soc. xvi. p. 274, White Mountains; *C. abeillii*, Bauduer, Bull. Soc. Ent. Fr. (5) iv. p. clxiii., Jerusalem; *C. basalis*, Crotch, l. c. p. 80, California: spp. nn.

Phyllotreta funesta, sp. n., Baly, l. c. p. 196, Japan.

Orchestris ramosa, sp. n., G. R. Crotch, Tr. Am. Ent. Soc. v. p. 80, N. California.

Aphthona sordida, *strigosa*, p. 197, *pygmæa*, and *A. ? collaris* and *pryeri*, p. 198, spp. nn., Baly, l. c., Japan.

Thyamis adamsi, *lewisi*, p. 199, *bimaculata*, p. 200, *amicula*, *inconspicua*, p. 201, spp. nn., *id.* l. c., Japan.

Argopistes coccinelloides, sp. n., *id.* l. c. p. 202, Japan.

Sphaeroderma seriata [-tum], *tarsata* [-tum], p. 203, *japana* [-num], p. 204 *separata* [-tum], *apicalis* [-le], p. 205, spp. nn., *id.* l. c., Japan.

Argopus clypeatus and *orientalis*, spp. nn., *id.* l. c. p. 206, Nagasaki.

Apteropoda nigro-picea, sp. n., *id.* l. c. p. 207, Nagasaki.

Plectroscelis granulosa, p. 207, *concinnicollis*, *cylindrica*, p. 208, *id. l. c.* Nagasaki; *P. perrisi*, p. clxi., St. Jean d'Acre, Jaffa, *orientalis* (? = *conducta*, Mots., *nec* Foudr., the latter being provisionally re-named *foudrasi*), p. clxii., Mersina, Bauduer, Bull. Soc. Ent. Fr. (5) iv. : spp. nn.

Psylloides angusticollis, *punctifrons*, p. 209, *difficilis*, p. 210, spp. nn., Baly, *l. c.*, Nagasaki.

Monarthra cyaneum [-ea], p. 210, *fulvum* [-va], p. 211, spp. nn., *id. l. c.*, Japan.

Hispides.

Hispa mærens, *japonica*, p. 215, Japan and China, *subquadrata*, p. 216, Japan, spp. nn., J. S. Baly, Tr. E. Soc. 1874.

Odontota hardii, sp. n., G. R. Crotch, Tr. Am. Ent. Soc. v. p. 80, California.

Cassidides.

Cassida. Observations upon 10 Russian species; G. Kraatz, Hor. Ent. Ross. x. pp. 124-128. *C. sibirica*, Gebl., ? = *lineola*, Creutz., var.

Notices of the real and reputed German species; *id.* B. E. Z. xviii. pp. 83-101. Synonymic list of 17 German species, from MS. of Gemminger & Von Harold's Catalogue; *id. l. c.* p. 102. *Cassida austriaca*, F., = *canaliculata*, Laich.; *C. filaginis*, Perris, = *seladonia*, Gyl., var.; *C. chloris*, Cornelius, = *stigmatica*, Suffr.; *C. languida*, Cornel., = *chloris*, Suffr.; *C. herbea*, Luc., = *deflorata*, Suffr.; *C. prasina*, Boh., *nec* F., = *algorica*, Luc.; *C. depressa*, Suffr., = *bohemanii*, Bris., = *inquinata*, Brullé, var.; *C. angusticollis*, Hagenb., is queried as Brazilian; *C. vittata*, F., = *fastuosa*, Schall.; *C. obsoleta*, Ill., = *flaveola*, Thunb.; *C. vibex*, F., = *lirio-phora*, Kby.; *C. equestris*, F., = *viridis*, L.; *C. viridis*, F., *rubiginosa*, Ill., = *vibex*, L.; *C. oblonga*, Ill., = *vittata*, Villers. 11 species from Andulasia, 7 from Greece, 7 from Tuscany, 2 from Nice, and 3 from Salonica, enumerated; *id. l. c.* p. 104.

A synoptical table of the French species, with food-plants, by S. A. de Marseul, Feuil. Nat., Nos. 39, 40 & 41, pp. 29-31, 40-42, 50 & 51, also in separate form, pp. 1-7.

Species feeding on other plants than *Compositæ*; L. Fairmaire, Bull. Soc. Ent. Fr. (5) iv. p. xvi.

Cassida sanguinosa; oviposition described by E. Perris, Nouv. et faits, No. 46, p. clxxxviii. *C. nebulosa*, L., from Japan; J. S. Baly, Tr. E. Soc. 1874, p. 213.

Pæcilaspis angulata, Germ., from Brazil, found on *Heracleum sphondylium* near Rotterdam; Tijdschr. Ent. xvii. Versl. p. lxxviii.

Homoplata flava protects its eggs and the larvæ when hatched against Ichneumons, flies, and other enemies. Weyenbergh, Period. Zool. Argent. i. pt. i. pl.

Cassida japana, *erudita*, p. 212, Japan, *consociata*, p. 213, Japan and Tartary, Baly, *l. c.*; *C. humeralis*, Andalusia, and var. from Tangiers, G. Kraatz, B. E. Z. xviii. p. 103; *C. sareptana*, p. 126, *flaviventris*, p. 127, *Sarepta*, *id.* Hor. Ent. Ross. x.; spp. nn.

Coptocyclus levisi, sp. n., Baly, *l. c.* p. 214, Hiogo.

1874. [VOL. XI.]

Z

EROTYLIDÆ.

Triplax clavata, Lac., is apparently distinct from *T. rufipes*; J. Emery, Nouv. et faits, No. 46, p. clxxxv.

Zythonia, g. n., J. O. Westwood, Thesaurus ent. oxon., p. 107. Nearest to *Triplax*. *Z. fulva*, sp. n., *id. ibid.* pl. v. fig. 1, Guinea.

Cyrtotriplax 8-notata, L. Bedel, Bull. Soc. Ent. Fr. (5) iv. p. cxvii. Transcaucasia; *C. niponensis*, Japan, *consobrina*, S. Siberia, G. Lewis, Ent. M. M. xi. p. 78: spp. nn.

Episcapha taishoensis, sp. n., G. Lewis, *l. c.* p. 79, Chiosan, and Tsushima, Straits of Korea.

ENDOMYCHIDÆ.

Cyanauges, g. n., H. S. Gorham, Ent. M. M. xi. p. 54. Differs from *Endomychus* in the conically acuminate apical joint of its maxillary palpi. *C. gorhami*, sp. n., G. Lewis, *tom. cit.* p. 55, S. E. Japan.

Eumorphus murrayi, p. 437, Philippine Isles, *sanguinipes*, p. 438, ? Java, spp. nn., H. S. Gorham, Tr. E. Soc. 1874.

Pedanus levis, sp. n., *id. l. c.* p. 439, locality unknown.

Encymon regalis, sp. n., *id. l. c.* p. 440, Philippine Isles.

Corynomalus colon, p. 440, Cayenne, *coriaceus*, p. 441, New Fribourg, spp. nn., *id. l. c.*

Lycoperdina castaneipennis, sp. n., *id. Ent. M. M. xi.* p. 151, Japan.

Saula japonica, sp. n., *id. op. cit.* x. p. 224, S. Japan.

Mycetina candens, p. 441, Ceylon, *africana*, p. 442, Cameroon Moun-tains, W. Africa, spp. nn., *id. Tr. E. Soc.* 1874.

Epopterus clara and *dives*, spp. nn., *id. l. c.* p. 443, Amazons.

Stenotarsus leoninus, *philippinarum*, p. 444, *tabidus*, p. 445, Philippine Isles, *indianus*, N. India, *russatus*, Ceylon, p. 446, *id. l. c.* spp. nn.

Symbiotes niponensis, sp. n., *id. Ent. M. M. xi.* p. 225, S. Japan.

COCCINELLIDÆ.

CROTCH, G. R. A Revision of the Coleopterous family *Coccinellidæ*. London: 1874, 8vo, pp. i.-xv., 1-311.

This volume, the expense of printing which has been defrayed out of the funds of the Syndics of the (Cambridge) University Press, was seen through the press by Mr. R. H. F. Rippon, after the author's death. A history of the family is given, containing references to all species described from Linnaeus (1758) inclusively, with synonymy and names of the genera to which they are now attributed. The following sub-divisions are adopted:—Sub-family I. *Coccinellidæ genuinæ* (anterior coxal cavities closed), tribes *Epilachnides* (surface pubescent, punctuation uneven, &c.), *Coccinellides* (surface glabrous, punctuation generally uniform, eyes never bordered by the genæ, &c.); II. *Tytthaspides* (ligula emarginate, scutellum small); III. *Chilocorides* (includes the early portion of Mulsant's *Hyperaspides* and *Platynaspis*; prosternum produced so as to conceal the mentum, femora received into deep cavities); IV. *Hyperas-*

pides (antennæ short, epipleura deeply foveolate for the femora, 7 ventral segments apparent in ♂); V. *Scymnides*; VI. *Exoplectrides* ("quite heterogeneous"), with groups *Ortalix*, *Azya*, and *Exoplectra*; VII. *Rhizobiides* (eyes coarsely granulated, except in *Poria*; antennæ long, anterior coxal cavities open), of which 6 genera form "Tribe 3, *Discotomides*" (p. 15), stated, p. 302, to be one of the most distinct among the *Coccinellidæ*, of oblong depressed form, with generally serrate antennæ, 6 ventral segments, and open anterior cotyloid cavities. There is evidently a contradiction in these statements as to the value to be attributed to this group.

The number of species discussed is 1341, of which 33 are doubtful and 239 new; the total number of genera is 137, of which 21 are briefly characterized as new, including *Euseladia*, brought forward by the author in his synonymic list [Zool. Rec. viii. p. 329] with several other genera, all of which are, with the exception of that genus, considered as thereby established. It is not possible here to reproduce the very numerous synonyms (chiefly of Mulsant's species) established or suggested by the author. The following observations occur:—

Epilachna v-pallidum, Blanch., var. n., *vittigera*, Peru, p. 58; *E. ocellata*, Bertol., nec Redt., re-named *abyssinica*, p. 73; *E. guttato-pustulata*, F., var. n. *tasmanica*, p. 78, Tasmania; *E. montrouzieri*, Fauv., var. n. *fijiensis*, p. 89, Fiji; *Subcoccinella*, Huber, adopted for *Lasia*, Hope, nec Wied. (Dipt.); *Coccinella labilis*, Muls., = *distincta*, Redt.; *Leis manillana*, Muls., varr. nn. *atro-cincta*, Manilla, *mniszewski*, Mindanao, *incompleta*, Philippines, p. 120; *Ballia diane*, Muls., varr. nn. *saundersi*, p. 127, *perplexa*, p. 128, India; *Caria dilatata*, F., var. n., *suffusa*, p. 171, Flores; *Micraspis*, Muls., nec Hope, is re-named *Tythaspis*, p. 181 (type, *Cocc. 16-punctata*, L., of which a black var. is recorded from England); *Chilocorus renipustulatus*, Woll., nec Scriba, re-named *canariensis*, p. 185; *Hyperaspis jucunda*, Lec., nec Muls., re-named *leontii*, p. 233; *H. 6-pustulata*, Mots., re-named *caucasica*, p. 236; *H. inedita*, Muls., ♂, re-named *mendica*, p. 238; *Scymnus 4-lunulatus*, Ill., = *pulchellus*, Hbst.; *S. binotatus*, Bris., = *kiesenwetteri*, Muls.; *S. rufipes*, Bris., re-named *bri-souti*, p. 248; *S. suturalis*, Mots., re-named *motschulskii*, p. 253; *S. limbatus*, Mots., re-named *victoris*, p. 253; *S. suturalis*, Lec., re-named *leontii*, p. 264.

The following new genera and species are characterized (in all cases very briefly):—

Semi[ot]adalia, p. 98. Differs from *Hippodamia* in its complete abdominal plate and dentate claws. Type, *Idalia inquinata*, Muls.; also *Coccinella 11-notata*, Schn.

Xanthadalia, p. 99. Differs from *Harmonia* in the abdominal plates covering only half the segment, and often complete, &c. Type, *H. sommeri*, Muls.; also *H. rufescens*, Muls.

Lioadalia [*Liad*], p. 103. Differs from *Adalia* in its extremely fine obsolete punctuation. Type, *Cocc. flavo-maculata*, Deg.; also *Micraspis signifera*, Rche., *Adalia luteo-picta* and *gemmingeri*, Muls., and *L. intermedia*, sp. n., p. 103, Abyssinia.

Stictoleis, p. 118. Differs from *Leis* by its ovate, very convex form,

the elytra not flattened out at the sides, the scutellum not sinuate before the tip. Type, *Cocc. coryphæa*, Guér.; also *Leis thonningi* and *instabilis*. Muls., and *L. clathrata*, M., = *22-signata*, M., = *Cocc. 22-maculata*, F.

Ptychanatis, p. 122. Antennæ much as in *Anatis*, plates V-shaped as in *Coccinella*, elytra sometimes with an apical plica, &c. Type, *Coccinella axyridis*, Pall., under which 16 supposed species, of Mulsant and others, are sunk; also *Leis bisseznolata*, Muls.

Bothrocalvia, p. 143. Differs from *Calvia* in its hemispherical shape, faint punctuation, and deep well-marked fovea on the thoracic epipleuræ. Type, *Cocc. albo-lineata*, Schön.; also *B. lewisi*, sp. n., *ibid.*, Foochow.

Anisolemnia, p. 146. Next *Sphaeroneda*. Metasternum slightly, mesosternum deeply, emarginate, elevated, strigosely punctate; elytra margined, epipleuræ foveolate. Type, *A. complicata*, *ibid.*, Ternate; also *A. ceramensis*, Ceram, *anomala*, Amboina, p. 147, *obliterata*, *ibid.*, and *alutacea*, p. 148, Macassar, spp. nn., and *Caria distaura* and *faiirii*, Muls.

Mononeda, p. 169. Distinct from *Neda* by the non-acuminate epipleuræ and non-incrassate margins of the elytra. Type, *Cocc. marginata*, L.

Archæoneda [Archæo-], p. 169. Type, *Cocc. tricolor*, F.; also *Neda princeps*, Muls.

Docimocaria, p. 172. Allied to *Caria*, but with long antennæ, punctuation evident, &c. Type, *D. insignis*, sp. n., *ibid.*, Manilla; also *Caria cumingi*, Muls.

Cyrtocaria, *ibid.* Type, *Cocc. regulis*, Ol.; also *Leis inflata*, Muls.

Anisorcus, p. 190. Differs from *Eoichomus* in its incomplete abdominal plates. *A. fryi* and *affinis*, Fiji, *malayanus*, Malasia, p. 191, spp. nn.

Sticholotis, p. 200. Form of the *Chilocorides*, but with coarsely granulated eyes and hardly foveolated epipleuræ, indicating affinity with *Rhizobius*. Type, *S. substriatus*, *ibid.*, and *punctatus*, p. 201, Japan; also *Lotis confucii*, Muls.

Stictobura, p. 201. Allied to *Bura*, but anomalous, from its comparatively long antennæ. *Calvia pallidiguttata*, Muls.

Palæoneis, p. 205. Allied to *Cryptognatha*; extremely anomalous. *P. aurantiaca*, Malacca, *coccinea*, Sarawak, *ibid.* spp. nn.

Anisoscymnus, p. 273. Differs from *Scymnus* in its unequal punctuation. Type, *Cocc. rufipes*, F.

Pseudoladوريا, p. 278. Next *Zenoria*. *P. simulans*, sp. n., *ibid.*, Ega.

Rhynchortalia, *ibid.* *R. insueta*, *ibid.*, Malasia.

Cyrtaulis, p. 295. Allied to *Aulis*. *C. puberula*, sp. n., *ibid.*, Madagascar.

Neorhizobius, p. 300. *N. chilensis*, sp. n., *ibid.*, Chili.

Epilachna viridilineata, *viridinitens*, *variabilis*, p. 55, *imperfecta*, *per-similis*, p. 56, *convergens*, *peruviana*, p. 57, Peru, *archidona*, p. 56, Archidona, Bolivia, *inconstans*, p. 56, *buckleyi*, *opacula*, p. 57, *approximata*, p. 58, *univittata*, p. 59, *nigro-vittata*, *mutabilis*, p. 60, *bizonata*, *fryi*, p. 61, *extrema*, p. 64, Ecuador, *erichsoni*, p. 58, Veragua, *äubia*, p. 59, Quito, *cinctipennis*, p. 60, Venezuela, *pictipennis*, p. 60, New Granada, *simillima*.

p. 63, Bogotá, *vincta*, p. 63, Guatemala, *clarki*, p. 65, Minas Geraes, *pertyi*, p. 67, Rio Negro, *batesi*, p. 68, Ega, *raptor*, p. 69, *gibbosa*, *cribrata*, p. 70, *adjuncta*, p. 76, Angola, *ellisi*, p. 71, Madagascar, *occidentalis*, p. 73, Sierra Leone, *murrayi*, *africana*, p. 74, Old Calabar, *zuluensis*, p. 77, Zulu, *suffusa*, p. 78, Australia, *deyrollii*, *moorii*, p. 78, Darjeeling, *papuensis*, *aruensis*, *persimilis*, p. 79, Indian Archipelago, *pembertoni*, p. 80, Bhootan, *gibbera*, *parvula*, *fasciolata*, *sanscrita*, p. 82, India, *admirabilis*, p. 81, China, Japan, *zeylanica*, Ceylon, *decipiens*, Java, p. 83, *moultoni*, p. 89, New Caledonia.

Adalia indica, p. 101, 'India.'

Coccinella germaini, p. 106, Chili, *ocelligera*, p. 108, Brazil.

Leis dunlopi, India, *cerasicolor*, Bourou, *aterrima*, Ceram, *papuensis* and var. *suffusa*, New Guinea, p. 121, *deyrollii*, p. 122, locality unknown.

Pelina borrii, p. 126, Brazil.

Neocalvia guerini, Brazil, *mniszewski*, Cayenne, p. 130.

Egleis pascoii, p. 131, Australia.

Halysia funerea, p. 132, Dorey.

Thea chapuisi, p. 134, Java.

Psyllobora bowringi, Cayenne, *distinguenda*, Brazil, p. 136, *lacteola*, Rio Janeiro, *lutescens*, Guatemala, *approximata*, ? Brazil, p. 138, *ega*, Ega, *marshalli*, Cayenne, p. 140, *nigro-vittata*, p. 142, Jamaica.

Cleis concolor, p. 142, Mexico.

Anisocalvia vishnu, *krishna*, *buddha*, p. 145, N. India, *sykesi*, p. 146, Dukhun.

Cælophora mouhoti, Laos, *swinhoii*, Formosa, *nepalensis*, Nepal, p. 149, *pulchra*, Malasia, *aruensis*, Aru, *formosa*, Menado, p. 150, *bowringi*, Burmah, *deficiens*, Penang, p. 152, *approximans*, p. 153, China, *funnebris*, Bangalore, *javanica*, Java, p. 154, *varicolor*, Batchian, *vivida*, Australia, *jansoni*, Cape York, p. 155, *wallacii*, Kai, *ripponi*, Australia, *simulans*, Madagascar, *elegans*, Gaboon, p. 156.

Propylea kehamæ, p. 158, India.

Dysis saundersi, locality unknown, *excellens*, Cochin China, p. 160.

Callineda decussata, Malasia, *duplicata*, Australia, p. 161.

Cycloneda retrospiciens, p. 163, Mexico, *metallica*, p. 164, River Amazon, *antillensis*, p. 166, Trinidad, *fryi*, p. 167, Peru, Ecuador.

Megalocaria pearsoni, p. 170, Darjeeling.

Caria welwitschi, p. 171, Angola.

Verania flavo-vittata, p. 176, Melbourne, *malaccensis*, p. 177, Gilolo.

Chilomenes unicolor, Algeria, *isis*, Egypt, p. 180, *polynesiae*, Fiji, &c., *rufipennis*, Madagascar, p. 181.

Chilocorus discoideus, p. 184, W. Africa, *angolensis*, p. 186, Angola, *wallacii*, *malasie*, *3-maculatus*, *sublineatus*, p. 187, Malasia.

Orcus artensis, p. 188, Art Island.

Exochomus dallasi, Ega, *adeleæ*, Columbia, and (*E.* ?) *hypomelus*, Madagascar, p. 194.

Brumus olcesii, Tangiers, *hexasticta*, Peru, p. 195.

Platynaspis capicola, Graham's Town, *saundersi*, India, *higginsii*, Gold Coast, *stictica*, Singapore, p. 197, *lewisi*, Shanghae, *wallacii*, Flores, *variegata*, Cochin China, p. 198.

- Aspidimerus mouhoti*, p. 202, Laos.
Cryptogonus malasiae, Mysol, *sinensis*, China, *japonicus*, Japan, p. 203.
Cryptotæmus wallacii, Gilolo, *affinis*, Batchian, *subviolaceus*, Macassar, p. 204.
Cryptognatha batesi and *yolandi*, Ega, *æthiops*, Columbia, p. 206, *reedi*, Bahia, *clarki*, *fryi*, *appropinquans*, Rio Janeiro, *flaviceps*, Amazons, p. 207.
Tiphysa ega, p. 210, Ega.
Brachyacantha buckleyi, p. 210, Ecuador.
Hyperaspis dilatata p. 213, Ega, Cayenne, *silvani*, p. 214, *emiliae*, *emmae*, p. 215, *ceciliae*, p. 218, *insignis*, p. 226, *albo-punctata*, p. 229, Brazil, *aliciae*, p. 215, *psylloboroides*, *hybridula*, p. 218, New Friburg, *camelina*, p. 217, *unipunctata*, p. 230, Santarem, *suzannee*, Cumana, *margaritæ*, Bogotá, p. 219, *mariae*, Columbia, *carolinae*, Bahia, p. 220, *victoriae*, Cayenne, *petropolitana*, Petropolis, *carolinae*, locality unknown, *ega*, Ega, p. 223, *eupaleoides*, p. 224, Minas Geraes, *sagittata*, *incompleta*, p. 225, Columbia, *subsignata*, p. 226, Mexico, Texas, *germaini*, p. 228, *chilensis*, p. 231, Chili, *subapicalis*, Rio Janeiro, *deyrollii*, Teapa, p. 229.
Ortalia scabrosa, Macassar, *proxima*, Menado, *wallacii*, Aru, p. 276.
Proditis marginithorax, p. 276, Mexico.
Zenoria rodolioides, p. 277, Santarem, *major*, p. 278, locality not mentioned.
Ladoria rudepunctata and *discomaculata*, p. 280, Rio Janeiro.
Rodolia rowlandi, p. 281, Macassar.
Vedalia westermanni, Celebes, *guerini*, Pondicherry, p. 282.
Novius algiricus, p. 283, Blidah.
Ezoplectra batesi, Ega, *dubia*, Bahia, p. 284, *fryi*, p. 285, Cayenne, *santaremae*, *amazonica*, *irregularis*, p. 286, Amazon district.
Chnoodes clarki, Rio Janeiro, *pentagona*, Santarem, p. 287.
Dapolia sanguinipes, p. 288, ? S. America.
Poria sallæi, Mexico, *hæmatomelas*, Espirito Santo, p. 289, *deyrollii*, Minas Geraes, *batesi*, *amazonica*, San Paulo, p. 290.
Eupalea mniszéchi, p. 290, Bogotá, *pulchra*, Venezuela, *reinhardti*, Sete Lagos, *fryi*, *intermedia*, Brazil, *conglomerata*, Rio Janeiro, p. 291.
Oryssomus germaini, *chilensis*, *fairmairii*, p. 292, *varius*, *flavo-marginatus*, p. 293, Chili, *deyrollii*, p. 292, Brazil.
Aulis redtenbacheri, locality unknown, *circumcincta*, Brazil, p. 294.
Dioria anomala, p. 296, San Paulo.
Rodatus bakewelli and *boucardi*, p. 297, Australia.
Rhizobius breweri, *submetallica* [-cus], *hirtellus*, *elongatulus*, p. 298, Australia.
Lithophilus major, Kurdistan, *pallidus*, Persia, p. 302.
Euseladia (briefly characterized, p. 303) *waterhousii*, p. 304, S. America.
Micaria josephinae, p. 306, Santarem.

Some common Canadian species briefly described and figured; R. V. Rogers, Canad. Ent. vi. pp. 81-85, figs. 9-15.

A classified descriptive account of the known species of the Argentine States; C. Berg, Bol. Ac. Cordova, i. pp. 284-293. *Epilachna æquinotialis*, Muls., = *pænulata*, Germ., var.; *id. l. c. p. 292*. Observations on its metamorphoses, and ravages caused by it in La Plata; D. H. Weyenbergh, Anales de Agricultura, i. p. 69.

Coccinella bipunctata devouring about 60 eggs of a Lepidopterous insect; J. E. Fletcher, Ent. M. M. xi. p. 85.

Coccinella 11-punctata, Ol., is the same as Linnæus's species of that name, and Reiche's proposed name, *egyptiaca*, for it is, therefore, not needed. G. Kraatz, B. E. Z. xviii. p. 303.

Hyperaspis erythrocephala, F., from Derbent. Observations on its characters and the confusion concerning it in catalogues, &c.; *id. l. c. p. 301*. *H. 4-maculata* Redt., and *6-guttata*, Bris.; differential characters discussed; *id. l. c. p. 302*.

Lasia meridionalis, Mots., = *globosa*, Schn.; *Hyperaspis concolor*, Suffr., is probably specifically distinct from *campestris*, Hbst.; E. Abeille, Bull. Soc. Ent. Fr. (5) iv. pp. ccxxv. & ccxxvi.

Lithophilus cordatus exudes from its joints a liquid precisely similar to that secreted by *Coccinella*; Puton, *tom. cit. p. ccl*.

Scymnus pusillus, Berg, *l. c. p. 293*, Palermo, La Plata; *S. pacificus, coniferarum, phelpsi*, G. R. Crotch, Tr. Am. Ent. Soc. v. p. 77, California: spp. nn.

HYMENOPTERA.

BY

E. C. RYE, F.Z.S.

THE GENERAL SUBJECT.

DOURS, A. Catalogue synonymique des Hyménoptères de France. Mém. Soc. L. N. Fr. iii. (1872-1873). [Reviewed, R. Z. (3) ii. pp. xl.-xlii.; Pet. Nouv. vi. p. 389; Feuil. Nat. No. 44, p. 97.]

The first Catalogue of the Order published in France. 2700 species are contained in it, with full synonymy, and notes of parasitism, &c.

LUBBOCK, SIR JOHN. Observations on Bees and Wasps. J. L. S. xii. pp. 110-139.

An account of experiments made with the view of discovering the extent of the power of inter-communication possessed by these insects, and showing that no such power exists; bees, indeed, being stated to be much less clever in finding things than was expected. Bees make, on the average,

five excursions in an hour; they will enter a strange hive without molestation; their 'affection' for each other is merely for the sake of the honey; they are much affected by light, and can distinguish colours, but are not affected by sounds, however loud and penetrating. Wasps seem more clever than bees in finding their way; make about the same number of excursions per hour; are also capable of distinguishing colours, and apparently regardless of sound. An individual of *Polistes gallica* was kept for nine months, and tamed enough to bear handling.

MARSHALL, T. A. New British species, corrections of Nomenclature, &c. Ent. Ann. 1874, pp. 114-146.

Refers to *Cynipidæ*, *Ichneumonidæ*, *Braconidæ*, and *Proctotrypidæ*, and contains valuable original remarks on habits, &c., including bibliography of the chief literature of parasitic *Cynipidæ*, and a list of species of *Ichneumonidæ* and *Braconidæ* bred from various other insects (chiefly *Lepidoptera*), with the names of the latter. One new genus and 3 new species are described, and some synonymy is given.

MOCŠÁRY, A. Zur Hymenopteren-Fauna Siebenbürgens. Verh. siebenb. Ver. xxiv. pp. 117-122.

Not seen by the Recorder. 50 *Tenthredinidæ* are included in it, *teste* Zaddach, Schr. Ges. Königsb. xvi. p. 35.

MORAWITZ, F. Die Bienen Daghestans. Hor. Ent. Ross. x. pp. 129-189.

138 species (some new), in 34 genera (1 new).

SCHLECHTENDAL, D. H. R. VON. Beiträge zur Kenntniss der Fauna von Zwickau. Verzeichniss der bisher bei Zwickau beobachteten Blatt-, Holz-, Gall-, Raub-, und Falten-wespen. JB. Ver. Zwickau, 1871 [1872], pp. 25-38.

A mere list of names of known species, with occasional observations. The author publishes a first supplement, *op. cit.* 1872 [1873], pp. 2-14, pl.

SIEBKE, H. Bidrag til Norges Insektfauna. Beretning om en i Osterdalen foretagen Reise i. 1870. N. Mag. Naturv. xix. (1873) pp. 39-102.

Not seen by the Recorder. 37 species of *Tenthredinidæ* and *Uroceridæ* are recorded, pp. 60-62 (*teste* Zaddach, *ut supra*).

VOLLENHOVEN, S. C. SNELLEN VAN. Pinacographia. Illustrations of more than 1000 species of North-West-European Ichneumonidæ sensu Linnæano. Afbeeldingen van meer dan 1000 Soorten van Noordwest-Europeesche Sluipwespen (Ichneumones sensu Linnæano). 's Gravenhage: 1875 [published in 1874], 4to, pp. 1-8, pls. i.-iv.

The above-mentioned part is the commencement of a book of reference (written in Dutch and English) for good figures of entomophagous *Hymenoptera*, the letterpress being subservient to the plates. New species are described in it.

F. Walker (London: 1874, 8vo, pp. 1-48) commences a "Translation of Synoptical Arrangements of some European Families and Genera of Hymenoptera." Foerster's Synopsis of the 'Cynipites' and 'Braconites,' and a Synopsis of the 'Ichneumonites' adopted from Holmgren and Taschenberg, are given in this part.

Hymenopterous insects living in or in connection with oak-leaves, *id.*
Ent. vii. p. 92.

E. Greenland. *Bombus pratorum*, *Cryptus sponsor*, and *Limneria difformis* recorded by A. Gerstäcker, in "Die zweite deutsche Nordpolarfahrt" (Leipzig: 1874, 8vo), ii. p. 404 (note by A. Pansch).

Captures in Norwich and Sussex, and at Anglesea: F. Smith, Ent. vii. pp. 66-68. At Rotterdam; C. Fransen, Tijdschr. Ent. xvii. Versl. pp. lxxv. & lxxvi. In N. Italy; G. Gribodo, Bull. Ent. Ital. vi. pp. 150-153.

Spain. A list of 151 species, named by L. Dufour; Martinez y Saez, *Act. Soc. Esp.* iii. pp. 89-91.

S. W. Africa. Remarks on a small collection from Lower Guinea (chiefly near the mouth of the Congo), by C. Ritsema, Tijdschr. Ent. xvii. pp. 175-211, pl. xi. 27 species are described (13 new).

Japan. In describing 88 new species, chiefly taken by Mr. G. Lewis, F. Smith, Tr. E. Soc. 1874, pp. 373-409, notes that the general aspect of the collection is European, only one exotic form (*Thyreodon*) occurring. Several species very closely resemble European, and even English, forms, and one or two are absolutely identical with the latter. F. Walker, Cist. Ent. pt. xi. pp. 301-310, describes 24 further species.

APIDÆ.

C. F. SCHENCK, B. E. Z. xviii. pp. 347-349, considers Latreille's system artificial, on account of its separation of genera with evidently natural affinities. The German bees fall very naturally into the following 3 sections (sub-families *b* and *d* are exotic):—

I. SOCIAL.

Tribe 1. Permanently social. Subfam. *a*, Apidae (*Apis*).
b, Meliponidæ (*Melipona*,
Trigona).
Tribe 2. Social for one year *c*, Bombidæ (*Bombus*).
d, Eulemidæ (*Eulema*, *Euglossa*).

II. SOLITARY CELL-BUILDERS.

Tribe 1. Collecting pollen with the tibiae
(*Podilegidae*, *Crurilegidae*, *Scopulipedes*) e, *Anthophoridæ* (*Anthophora*, *Saropoda*, *Tetralonia* = *Macrocera*, *Eucera*, *Meliturga*, *Systropha*).
f, *Melittidæ* (*Cilipa*, *Macropis*).

Tribe 2. Collecting pollen with the femora (*Merolegidae*, *Femorilegidae*), sometimes also with the sides of the metathorax.....

g, *Xylocopidae* (*Ceratina*, *Xylocopa*).

h, *Rhophitidae* (*Rhophites*, *Rhophitoides*, *Halicitoides*).

i, *Panurginae* (*Panurgus*, *Dufourea*, *Dasypoda*, ? *Panurginus*).

j, *Andrenidae* (*Andrena*, *Halictus*, *Colletes*, *Nomia*, *Nomioides*).

Tribe 3. Collecting pollen with the abdomen (*Gastrilegidae*, *Dasygastera*).

k, *Megachilidae* (*Megachile*, *Chalicodoma*, *Lithurgus*, *Trachusa*, *Osmia*, *Heviades*, *Trypetes*, *Chelostoma*, *Anthidium*).

Tribe 4. Pseudo-parasites, with no collecting apparatus, but cell-builders...

l, *Sphecodidae* (*Sphecodes*).

m, *Prosopeidae* (*Prosope* = *Hylæus*).

III. PARASITES.

Tribe 1. Livers in cells (Guests, *Inquilinae*).....

n, *Psithyridae* (*Psithyrus* = *Apathus*).

Tribe 2. Solitary (true parasites)

o, *Melectidae* (*Melecta*, *Crocisca*, *Nomada*, *Epeolus*, *Epeoloides*, *Biastes*, *Parasites*, *Melittoxena*, *Ammobatoides*).

p, *Stelidae* (*Stelis*, *Celioxys*, *Dioxys*).

The author, p. 350, notes abnormal individuals of *Prosope variegata*, *Andrena listerella*, *Sphecodes ephippi* [at] *us*, *rufiventris* and *rufescens*, and *Apis mellifica*, the latter also a hybrid.

Von Hagens, B. E. Z. xviii. pp. 25-43, draws attention to the difference of structure in the genitalia of the males in various genera, and especially in *Sphecodes*, of which he describes those parts in 13 species (3 new), ascribing a greater range of variability to each on account of its parasitic life.

Andrenides.

Colletes parvulus, Mor., is an *Andrena*, and is re-named *colletiformis*; F. Morawitz, Hor. Ent. Ross. x. p. 159.

Halictus griseus, Schenck, = *punctatissimus*, Schk.; *H. albidus*, Schk., nec Lep., is re-named *albidulus*; *H. parumpunctatus*, Schk., ? = *semipunctatus*, Schk., ♂; *H. gracilis*, Mor., = *lucidulus*, Schk.; *Prosopis sinuatus*, ♀, Schk., = *clypearis*, Schk., ♀, and *Hyleus floralis*, *blandus*, *angulatus* and *siculus*, Först., are varieties of the latter; *H. xanthocnemis*, *æmulus*, *foveolatus*, *incongruus* and *nigriceps*, Först., = *confusus*, Nyl.; *H. schencki* and *annulatus*, Först., = *annularis*, K.; *H. gredleri*, *fumipennis* and *rubicola*, Först., and ? *Prosopis pygmæa*, Schk., = *brevicornis*, Nyl.; *Andrena tscheki*, Mor., = *bicolor*, Nyl., nec F. (*clarkella*, K.); *A. fallax*, Schk., nec Evers., is re-named *flavilabris*; and various observations are made on allied species found in Nassau; Schenck, B. E. Z. xviii. pp. 161-170. *Halictus pygmæus*, Schk., 1853, nec 1861, = *lucidulus*, Schk., 1861, ♂ [the name *pygmæus* must stand, and the subsequent species of the same name requires re-naming]; *Andrena hirtipes*, Schk., nec Pz., re-named *equamigera*; *A. mixta*, Schk., is a middle form between *varians* and *helvola*, K., of which *angulosa*, K., is the ♂; observations are also made on various allied species found in Nassau, and on *Sphecodes*, *Halictoides*, *Dufourea*, *Rhophites*, and *Hyleus*, not capable of condensation. *Id. tom. cit.* pp. 337-340, 345-347.

Colletes caspicus, sp. n., Morawitz, l. c. p. 174, Derbent.

Hyleus scutellaris, p. 176, Bacu, *rugicollis*, p. 177, Derbent, *id. l. c.*, spp. nn.

Sphecodes distinguendus, p. 39, *brevicornis*, p. 40, *variegatus*, p. 41, spp. nn., Von Hagens, B. E. Z. xviii. (? Clèves).

Halictus tricinctus and *bicinctus*, p. 161, *canescens*, p. 162, Schenck, l. c. Wiesbaden; *H. patellatus*, p. 162, *fallax*, p. 163, *caspicus*, p. 164, *riparius*, p. 165, *bicallosus*, p. 166, *coloratus*, p. 167, *pulvereus*, p. 168, *meridionalis*, p. 170, *semitectus*, p. 172, *cephalicus*, p. 173, Derbent, Morawitz, l. c.; *H. trizonatus*, E. T. Cresson, Tr. Am. Ent. Soc. v. p. 101, Nevada: spp. nn.

Agapostemon melliventris, sp. n., Cresson, l. c. [? N. America; no locality mentioned].

Nomia nevadensis, sp. n., *id. ibid.*, Nevada.

Nomioides jucunda, sp. n., Morawitz, l. c. p. 161, Derbent.

Andrena nobilis, p. 158, Derbent, *dentiventris*, p. 160, Curusch, *id. l. c.*; *A. albo-picta*, Radoschkowsky, *tom. cit.* p. 192, Erivan: spp. nn.

Apides.

O. de Bourmeister Radoschkowsky ['Bourmeister-Radosczkowsky' in Index], Bull. Mosc. xlvi. pt. i. pp. 132-164, continues his "Supplément indispensable," discussing species of his second sub-division 'Megachileoides,' and carrying the idea as to the importance of the structure of the maxillary organs [Zool. Rec. x. p. 348] so far, as to establish a mathematical diagnostic formula applying to them (p. 154). References are made to 55 figures of palpi, &c., contained in pl. i. *op. cit.* xlvii. *Megachile argentata*, Lep., nec F., = *pacifica*, Panz., of which 2 males are noted with a spur to the hooks of anterior tarsi; *M. vestita*, Gir., nec Smith, is re-named *giraudi* (p. 137); *Chalicodoma lefevrii*, Gerst., = *serrata*, Sm., = *albocristata*, Sm.; an un-named *Megachile* ? from France,

described, p. 151; *Melittoxena*, Mor., and *Biastes* are sub-genera of *Pasites*, Latr., which includes *schotti*, Pz., *punctata*, Sch., and *truncata*, Nyl.; *Ammobates carinata*, Mor., is a *Phileremus*.

Megachile 'centuncularis.' Habits of a Canadian insect referred to this species described by T. G. Gentry, Canad. Ent. vi. pp. 171-175.

Anthidium strigatum, Ltr. Description of a nest found under a stone (with observations on the down of plants used by other species in lining their cells); C. L. Kirschbaum, JB. nass. Ver. xxv. & xxvi. (1872), pp. 446 & 447. Description of its cells, including one of an abnormal construction; D. H. R. von Schlechtendal, JB. ver. Zwickau, 1872 [1873], pp. 12-14, pl., figs. 2 & 3.

Anthidium rufiventre, Sichel, = *Stelis carbonaria*, Sm.; *A. rufiventre*, Latr., = *Evaspis abdominalis*, F., of which full synonymy is given. C. Ritsema, R. Z. (3) ii. pp. 113-115.

Nomada. Various observations on the characters and variation of species described by Thomson & Smith, and their conflicting synonymy. *N. rufilabris*, Thoms., = *guttulata*, Schk. C. F. Schenck, B. E. Z. xviii. pp. 340-345.

Macrocera grisea, Eversm., = *Tetralonia 3-cincta*, Er. var.; Morawitz, Hor. Ent. Ross. x. p. 141.

Anthophora hypopolia, Dours, = *atricilla*, Eversm.; *A. atricilla*, Dours, = *romandi*, Ev.; Radoschkowsky, tom. cit. p. 192.

Xylocopa, *Pasites*, *Osmia*, *Bombus*, and *Nomada*. Observations on various species of these genera occurring in Nassau; Schenck, l. c. pp. 170-173.

Xylocopa monographed by F. Smith, Tr. E. Soc. 1874, pp. 247-302. 123 species are recorded. Its nearest ally is *Lestis*, with 4-jointed labial and maxillary palpi. *X. frontalis*, Ferr. & Gal., nec Ol., is re-named *carinata*, p. 265. Four species noted from Italy (2 new?), with a parasite (*Cryptus xylocopæ*, sp. n., not described); C. Rondani, Bull. Ent. Ital. vi. pp. 103-105.

Epicharis, p. 318, *Centris*, p. 357, *Eulema*, p. 440 (*E. fallax*, Sm., ? = *surinamensis*, L., var.), *Euglossa*, p. 443 (*Euglossa analis*, Westw., = *cordata*, L., var.), re-characterized, and the known species discussed; F. Smith, Ann. N. H. (4) xiii.

Humble-bees observed to bite holes at the base of the corolla in *Lathyrus sylvestris*, so as to obtain more ready access to the honey: the left nectar hole, being the larger, is constantly selected. The structure of the staminal tube of the scarlet-runner discussed, in connection with insect-operations. F. Darwin, Nature, ix. p. 189.

Bombus lucorum flying by night; W. A. Forbes, Ent. vii. p. 231.

Melipona and *Trigona*. Notes on the habits of Brazilian species reared by Drory at Bordeaux; especially as to the largest, *N. scutellaris*, the only domesticated one in its native country. A new genus of *Silphidae* is parasitic upon this species. 7 *Meliponæ* and 4 *Trigonæ* have been reared by Drory. M. Girard, Ann. Soc. Ent. Fr. (5) iv. pp. 567-573; Bull. pp. cvi. & cxi. These two genera are by no means intermediate between hive- and humble-bees, nor so nearly allied to them as is generally supposed. Their habits are briefly mentioned; in *Meli-*

pona, wax is secreted on the dorsal surface of the abdomen, and the cells are filled with food before the eggs are laid; some species are parasitic. Fritz Müller, *in litt.*; Nature, ix. p. 308. Further observations on these and allied Brazilian bees (two new species, *Trigona mirim* and *lilliput*, being named, but not described); *id. op. cit.* x. p. 102.

Apis mellifica. Giotti Ulivi (La Partenogenesi e Semipartenogenesi delle Api. Firenze, Roma: 1874, 8vo, pp. 1-24), from experiments, comes to the following conclusions:—1, That there can be no true parthenogenesis when a fertile copulation is admitted. 2, That the effect of the spermatid threads does not consist of a simple excitement of the supposed vital germ pre-existing in the egg, but of a real infusion of the absolute principle of life. 3, That no transformation of sex can be effected by spermatid injection.

On power of intercommunication, &c., in bees, see LUBBOCK, *suprà*.

Origin of the sting of the bee. A. S. Packard notes the priority of his own discovery over Oulianin, Kräpelin, and Ganin; Am. Nat. viii. p. 431.

Experiments on fermentation in bees, bee-bread, and pollen; and on some of the elements of honey; Erlenmeyer, SB. bayer. Ak. iv. pp. 204-207.

Circular combs, made by bees in hives moulded to shape for that purpose, recorded by M. Girard, Bull. Soc. Ent. Fr. (5) iv. p. ix.

G. de Layens's 'Élevage des Abeilles par les procédés modernes' reviewed, Pet. Nouv. vi. p. 458.

Instance of retention of memory of an old locality by bees; J. Topham, Nature, ix. p. 484.

Black specimens from Ireland; J. O. Westwood, P. E. Soc. 1874, p. xix.

New genera and species:—

Pseudoosmia [sic], Radoschkowsky, Hor. Ent. Ross. x. p. 152. Maxillary palpi 4-jointed; ventral palette formed of long, strong hairs, not depressed, but forming rows of isolated brushes; mandibles bidentate in ♂. *Megachile cristata*, Fonsc., *Osmia bisulca*, Gerst., *O. andrenoides*, Spin., *O. spinulosa*, Kby., *O. panzeri*, Mor., and *P. jakovlevi*, p. 155, Astracan, *taurica*, p. 157, Crimea, *parva*, p. 158, Frauenfeld, 10-*signata*, p. 159, Algeria, Egypt, *id. l. c.*

Plistotrichia, Morawitz, *l. c.* p. 134. Between *Habropoda* and *Tetralonia*, and especially like the ♀ of the latter. Type, *Nomia flavilabris*, Lucas.

Parevaspis, C. Ritsema, Tijdschr. Ent. xvii. Versl. p. lxxi. Allied to *Stelis*, *Evaspis*, and *Anthidium*. *Stelis carbonaria* and *abdominalis*, Smith, and *P. basalis*, *id. l. c.* p. lxxii., Japan.

Osmia viridana, p. 150, *nana*, p. 152, Derbent, Morawitz, *l. c.*; *O. thoracica*, Radoschkowsky, *tom. cit.* p. 192, Erivan.

Megachile maacki, p. 135, Petersburg, Irkoutsk, *mixta*, p. 138, Caucasus, *saussurii*, p. 142, Saratow, *algira*, p. 144, Algeria, *albo-cincta*, Egypt, *chinensis*, China, p. 145, *syraensis*, p. 146 (? = *ericetorum*, var.); Syra, *anthidioides*, Brazil, *funebri*, Cape of Good Hope, p. 147, *cornifera*, p. 148,

Sydney, *savigny* [sic], p. 150, Dalmatia, Egypt, Radoschkowsky, *l. c.*; *M. nigro-cincta*, C. Ritsema, Tijdschr. Ent. xvii. p. 205, pl. xi. fig. 9, Lower Guinea.

Anthidium affine, p. 116, Corfu, *insulare*, p. 118, Syra, *laticeps*, p. 121, Epirus, *littorale*, p. 153, Bacu, *alpinum*, p. 154, Curusch, *clypeare*, p. 155, Derbent, F. Morawitz, Hor. Ent. Ross. x.; *A. smithi*, p. 111, fig. 1, Java, *forsteni*, p. 112, fig. 2, Amboina, C. Ritsema, R. Z. (3) ii. pl. xvii.

Nomada immaculata, p. 179, *distinguenda*, p. 181, Derbent, Morawitz, *l. c.*; *N. pygmaea*, p. 342, *nana* and *megacephala*, p. 343, Schenck, B. E. Z. xviii. Wiesbaden.

Epeolus tarsalis, Morawitz, *l. c.* p. 182, Derbent.

Celioxys conspersa, p. 185, *pulchella*, p. 187, Derbent, *id. l. c.*

Crocisa affinis, *id. l. c.* p. 183, Derbent.

Euclera caspica, p. 145, *caucasica*, p. 147, Derbent, *id. l. c.*

Tetralonia velutina, p. 139, *fossulata*, p. 142. *nana*, p. 144, Derbent, *id. l. c.*

Melissodes nevadensis, E. T. Cresson, Tr. Am. Ent. Soc. v. p. 102, Nevada.

Anthophora albo-maculata and *caucasica*, Radoschkowsky, Hor. Ent. Ross. x. p. 190, Erivan.

Xylocopa oblonga, p. 256, *flavilabris*, p. 263, Cape of Good Hope, *cupripennis*, p. 261, Algeria, *producta* (? = *carinata*, ♂), p. 263, *angolensis*, p. 264, Angola, *inconstans*, p. 264, N'Gami, *rufescens*, p. 271, *ignita*, p. 276, E. India, *pictipennis*, p. 277, Java, *sonorina*, p. 278, Sunda Isles, *nigrocærulea*, p. 279, Celebes, *bombiformis*, p. 280, Philippines, *anthophoroides*, Brazil, Mexico, *artifex*, S. Brazil, p. 289, *lucida*, Pará, *ornata*, St. Paulo, p. 290, *rotundiceps*, Brazil, *similis*, Pará, *varians*, S. Brazil, p. 291, *metallica*, Pará, *ordinaria*, Tejuca, p. 292, *erratica*, S. Brazil, *electa*, Venezuela, p. 293, *mordax*, p. 294, San Domingo, and Lesser Antilles, *cyanea*, p. 296, *loripes*, p. 298, *tenuata*, *formosa*, p. 299, Mexico, *orpifex*, p. 298, California, F. Smith, Tr. E. Soc. 1874; *X. neglecta* (? = *albiceps*, St. F., nec Fab.), C. Ritsema, *l. c.* p. 207, Lower Guinea.

Eucharis globosa, Radoschkowsky, *l. c.* p. 193, Erivan.

Epicharis maculata, p. 320, Mexico, *scutellata*, *affinis*, p. 320, *conica*, *albo-fasciata*, p. 321, Brazil, F. Smith, Ann. N. H. (4) xiii.

Centris discolor, p. 360, *personata*, p. 362, *ardens*, p. 367, *apiformis*, p. 368, *concinna*, p. 370, *terminata*, *tarsata*, p. 371, *picta*, p. 372, Brazil, *melanchlæna*, p. 360, *ignita*, p. 362, *nigrocærulea*, p. 369, Mexico, *agilis*, p. 361, Vera Cruz, *semicærulea*, p. 363, Venezuela, *dentipes*, p. 366, Brazil, W. Indies, Mexico, *apicalis*, p. 367, St. Bartholomew, *insularis*, p. 367, *thoracica*, *simillima*, p. 370, San Domingo, *nitida*, p. 368, Honduras, *perforator*, p. 370, Pernambuco, *elegans*, St. Vincent, *crassipes*, Jamaica, p. 372, *id. l. c.*

Euglossa ignita, Jamaica, *decorata*, Brazil, *id. l. c.* p. 444.

Bombus alpinus, F. Morawitz, Hor. Ent. Ross. x. p. 132, Curusch (Daghestan); *B. ousiannikovi*, Radoschkowsky, *tom. cit.* p. 194, Erivan; *B. nevadensis*, Cresson, *l. c.* p. 102, Nevada, Arizona.

Trigona cacafogo [!], H. Müller, Nature, x. p. 31, ♂, ♀, & worker, Santa Catharina, Brazil. It "milks" the larva of a "*Membracis*" (? *Potnia indicator*, Fairm., teste Rogenhofer) [Zool. Rec. x. p. 349].

VESPIDÆ.

Paragia decipiens, Shuck., ♂ described from S. Australia; the species is much stylized (*Xenus* sp?). Confusion in the nomenclature of *P. tricolor*, Smith, pointed out. Kriechbaumer, S. E. Z. xxxv. pp. 254 & 255.

Odynerus. The species noted by Réaumur is probably *O. crassicornis*, Wesm., of which the habits are recorded; J. Lichtenstein, Bull. Soc. Ent. Fr. (5) iv. p. lxxxvi. On the habits and metamorphoses of *O. rubicola*; M. Régimbart, Feuil. Nat. No. 44, pp. 89-91.

Polistes. The aggregated clay nests described by Uhler [Zool. Rec. x. p. 352] are to be referred to *Pelopeus lunatus*, F., and not to any member of this genus, which makes paper-like cells and nests. C. V. Riley, Ann. Nat. viii. p. 229.

Observations on common British wasps; H. Reeks, Ent. vii. pp. 222-224. F. Smith, *tom. cit.* p. 257, corrects and supplements these notes.

Masaris occidentalis and *texanus*, spp. nn., E. T. Cresson, Tr. Am. Ent. Soc. iii. (1871) p. 348, Texas.

Eumenes walkeri, sp. n., C. Ritsema, Tijdschr. Ent. xvii. p. 199, pl. xi. fig. 7, Lower Guinea.

Belonogaster brunneus, sp. n., *id. l. c.* p. 202, Lower Guinea.

Polistes inornatus, sp. n., *id. l. c.* p. 203, pl. xi. fig. 8, Lower Guinea.

Vespa occidentalis, sp. n., E. T. Cresson, Tr. Am. Ent. Soc. v. p. 100, Nevada, New Mexico.

CRABRONIDÆ.

Hermann Burmeister, Bol. Ac. Cordova, i. pp. 36-47, in 'Scolie Argentinae,' discusses the species of the old genus *Scolia* attributed to Montevideo by Saussure & Sichel. *S. jucunda*, Sauss. & S., = *rufiventris*, F., var.; *Elis regina* and *nigra*, Sauss., = *atrata*, Kl., = *peregrina*, Lep., varr.; *Scolia lucasia*, Sauss., = *servillii*, Guér., var.; ♀ of *S. mutanda*, Sauss., described (*Elis variegata*, Sauss., being wrongly attributed to it as that sex by Saussure); *Elis fossor*, Sauss., = *S. variegata*, F.; 10 species in all are recognized from La Plata.

Tiphia inornata, Say. Parasitic on *Lachnosterna quercina*, and itself fed on by *Emmenadia pectinata*, F., var. *ventralis* (*Rhipidophoridae*); its habits, &c., described and figured. C. V. Riley, Rep. Ins. Mo. vi. pp. 123-126, fig. 34.

Pompilus rufipes, Tasch., nec Eversm., is re-named *taschenbergi*; C. Ritsema, Tijdschr. Ent. xvii. p. 137.

Sphex spirifer. Structure of cells and their store of insect-food described briefly and figured; Feuil. Nat. No. 40, p. 38, pl. ii. figs. 2-6.

Ampulex. Habits of the European species noted; *A. europæa*, Gir., = *fasciata*, Jur.; this insect is not congeneric with *compressa*, on which Jurine founded the genus *Ampulex*, and is dubiously referred to *Rhinopsis*, Westw.; Kriechbaumer, S. E. Z. xxxv. pp. 51-54.

Piagetia wardeni, Rits., treated as new [Ent. Mo. Mag. ix. p. 121; Nov. 1872], and figured; C. Ritsema, *l. c.* pp. 195-197, pl. xi. fig. 6.

H. Burmeister, *l. c.* pp. 97-129, 'Bembicidæ Argentinæ,' discusses the species occurring in La Plata, giving a summary of literature and external anatomy. Taschenberg has sunk many good species as varieties; *Monedula dorbignii*, Guér., is a true *Monedula*.

Cemonus unicolor, Lep., in briar stems; Bull. Soc. Ent. Fr. (5) iv. p. cxxviii. On its habits; J. Lichtenstein, *tom. cit.* p. clii.

Waagenia, g. n., Kriechbaumer, *l. c.* p. 55. *Sphegides*: pronotum tuberculated in the middle of posterior margin; anterior wings with 2 complete cubital cells, abdomen pedunculate, &c. *W. sikkimensis*, sp. n., *id. ibid.*, Sikkim.

Hemidula, sub-g. n. of *Monedula*. Burmeister, *l. c.* p. 119. Middle femora of ♂ with no teeth, or with the indication of one simple tooth, at the knee; body, and especially abdomen, more slender. *M. integra*, sp. n., *id. ibid.*, S. Corrientes, and *M. guttata* and *singularis*, Gerst.

Bembidula, g. n., *id. l. c.* p. 122. Mouth organs of *Monedula* and abdomen of *Bembex*. *Monedula discisa*, Gerst., and *Bembidula cingulata*, sp. n., *id. l. c.* p. 125, Cordova.

Scolia consularis, sp. n., *id. l. c.* p. 46, La Plata (? = *Elis variegata*, Sauss., ♂).

Pompilus elongatus, p. 188, fig. 3, *ornatissimus*, p. 191, fig. 4, spp. nn., Ritsema, *l. c.* pl. xi. Lower Guinea.

Ammophila guineensis, sp. n., *id. l. c.* p. 192, Lower Guinea.

Larrada vollenhor[en]ia, sp. n., *id. l. c.* p. 194, pl. xi. fig. 5, Lower Guinea.

Monedula arcuata, p. 112, Uruguay, *carbonaria*, p. 113, Rio Guiaquiraro, *decorata*, p. 114, Mendoza, Burmeister, *l. c.* spp. nn.

Stizus nevadensis, sp. n., E. T. Cresson, Tr. Am. Ent. Soc. v. p. 99, Nevada.

MUTILLIDÆ.

C. A. Blake's 'Synopsis of the *Mutillidæ* of North America,' Tr. Am. Ent. Soc. iii. pp. 217-265 (1871), noticed from Rec. Am. Ent. for 1871, in Zool. Rec. x. pp. 356 & 357, having been since seen by the Recorder, is now more fully treated. A general account is given of the structure and habits of the various genera. 102 N. American species of *Mutilla* (including *Psammotherma*, *Mutilla* proper, and a third sub-genus characterized as new) are described as known to the author, including many new, and 19 others are mentioned; and 18 species of a new genus, one of *Myrmosa*, and 2 of *Methoca*, are characterized. Tables of the species of *Mutilla* are given, both by ♂ & ♀ characters; the wing-neuration and structure of the first abdominal segment are figured in 3 divisions of *Mutilla* proper (p. 227), and the bodies of *M. sumichrasti*, Sauss., *arachnoides* and *cruciata*, Smith, are figured. *M. ornativentris*, Cresson, ? = *hexagona*, Say, ♀; *M. palliceps*, Cress., ? = *senex*, Guér., ♀; *M. gloriosa*, Sauss., ? = *sackeni*, Cress.

The following new species, &c., are described:—

Mutilla (Psammotherma) ajax, p. 226, Florida, *M. (proper) briaxus*, p. 227, Pennsylvania, Delaware (? = *vigilans*, Say), *grotii*, p. 228, Colorado, *ojaca*, p. 228, fig. *leona*, p. 230, *cinaloa*, *yucatanæ*, p. 231.

Mexico, *promethea*, p. 229, Louisiana, *sayi*, p. 229, *copano*, p. 232, Texas, *scrupea*, p. 230, Eastern States, *cubensis*, p. 231, Cuba.

Sphærophthalma, sub-g. n., pp. 217 & 232, fig. 10. Eyes circular, convex, polished. *M. (S.) scæva*, p. 232, *auripilis*, *gorgon*, p. 233, *zelaya*, *comanche*, p. 234, *bezar*, *waco*, p. 238, *canella*, *macilenta*, p. 239, *flavida*, p. 249, *gila*, p. 250, *brazoria*, p. 255, Texas, *coccineo-hirta*, p. 235, California; *hector* (? = *ægina*, Cress., ♂) and *castor*, p. 237, Kansas, *apicalata*, p. 238, *aztera*, p. 240, *cressoni* and *nortoni*, pp. 68 & 241, figs., *toluca*, p. 242, fig., *ariadne*, p. 243, fig., *formosa*, fig., *balopilas* (cf. p. 265), *altamira*, p. 244, *xalisco*, p. 245, fig., *tolteca*, p. 246, fig., *laticeps*, *xalapá*, p. 249, *zapoteca*, *robinsoni*, fig. p. 250, *lerma*, p. 251, *bisignata*, fig., *gothica*, fig., p. 252, *izucar*, *chiapa*, fig., *petricola*, p. 253, *auripes*, *minutissima*, *psammadroma* [-mod-], p. 254, Mexico, *obscura*, p. 239, *sanborni* (? = *simillima*, Sm., ♂), p. 248, Massachusetts; *melanosoma*, p. 240, Panama; *trisignata*, p. 241, *floridana* (? = *trisignata*, var.), p. 245, *oceola* (? = *dubitata*, Sm., ♂), p. 248, Florida; *iztapa* and *proserpina* (queried as ♂ & ♀ of the same species), p. 241, Honduras; *solola*, p. 243, Guatemala; *cypris*, p. 246, Georgia; *mutata* (? = *ferrugata*, F., var.), *scævola*, p. 247, *balteola*, p. 248, Atlantic States; *canadensis*, p. 252, Canada; also *Mutilla pennsylvanica*, St. F., and 31 other known species of *Mutilla*.

Agama, g. n., pp. 218 & 258 (abdomen figured, p. 259, figs. 1, 2, 3). Ocelli large; eyes round, body unicolorous, wings hyaline; abdomen generally petiolated, apex with 2 spines; ♀ unknown. *A. mendica*, p. 259, *triangularis*, p. 262, Nevada, *orizaba*, p. 259, Mexico; *imperialis*, p. 260, *danaus*, *melicausa*, p. 261, *tapajos*, p. 262, *pallida*, *hyalina*, *belfragii*, p. 263, Texas; *nokomis*, p. 260, *alcanor*, p. 264, Arizona; also *Mutilla unicolor*, Cress., and 5 other known species of *Mutilla*.

GERSTÆCKER, A. *Mutillarum Americæ meridionalis indigenarum*
Synopsis systematica et synonymica. Arch. f. Nat. xl. pp. 41-77,
299-328.

Mutilla cephalotes, Burm., nec Sweder., is re-named *specularis*, p. 47; *M. subtilis*, Burm., = *pachycnemis*, B., var.; *M. furonina*, B., = *chrysodora*, Pty.; *M. derasa*, F., = *spinosa*, Swed.; *M. derasa*, Burm., nec F., is re-named *serena*, p. 55; *M. læta*, Smith, Cat. Hym. iii. p. 57, nec p. 46, is re-named *hilaris*, p. 57; *M. bilunata*, B., = *melanocephala*, Pty.; *M. concinna*, Burm., nec Westw., is re-named *pectoralis*, p. 62; *M. diophthalma*, Burm., nec Klug, is re-named *trochanterata*, p. 67; *M. quadrum*, Burm., nec Klug, is re-named *vivax*, p. 70; *M. obsoleta*, B., nec K., re-named *bivittata*, and *M. americana*, B., nec L., re-named *duplicata*, p. 72; *M. tristis*, B., nec K., re-named *spectabilis*, p. 73; *M. atripes*, Sm., ? = *4-pustulata*, K.; *M. parallela*, B., nec K., re-named *sancta*, p. 303; *M. lugubris*, B., ♂, re-named *burmeisteri*; *M. myops*, B., ♂, re-named *funesta*, p. 316; *M. affinis*, B., ♂, re-named *æthiops*, p. 317; *M. furonina*, B., ♂, re-named *fulvipennis*, p. 325; *M. felina*, B., ♂, = *inaurata*, Sm.; *M. concinna*, B., ♂, re-named *dichrocera*, p. 326.

The following new species are described:—

Mutilla monacha, Brazil, *voluptuosa*, *moneta*, Bogotá, p. 47, *erythraspis*
1874. [VOL. XI.]

(? = *cephalotes*, Swed., ♂), *mystica, dulcis*, p. 48, *sumptuosa* (? = *dulcis*, ♀), p. 49, *empyrea, pretiosa*, p. 50, *macrops*, p. 59, *debilis, cubiceps*, p. 60, *chrysomalla*, p. 62, *nummularis*, p. 63, *polyspila*, p. 64, *harpyia*, p. 65, *virginalis, auriculata*, p. 67, *calycina*, p. 68, *lunigera, gemina*, p. 69, *austera, sigillata*, p. 70, *abrupta, hemicycla*, p. 71, *puella*, p. 72, *grossa*, p. 73, *zebrata, scripta, ursina*, p. 74, *juvenilis*, p. 75, *imbecilla*, p. 301, *geographica*, p. 302, *callizona*, p. 311, *pompiliformis, floccosa*, p. 314, *chrysozona, colorata, vulnerata*, p. 315, *melaleuca, foveiventris*, p. 316, *cristata, mesoleuca*, p. 317, *aterrima, rorida*, p. 318, *characterica*, p. 319, *soricina*, p. 320, *tenebrosa*, p. 321, *scoparia, gastrica, lucidiventris*, p. 322, *bembicina, cribrata, pygmea*, p. 324, *fastuosa*, p. 325, *holochrysa, deaurata*, p. 326, Brazil, *leptothorax*, Cayenne, *subula, tricondyloides*, Bogotá, *statua*, La Guayra, p. 51, *scenica*, p. 52, *umbratica*, p. 53, *confinis*, p. 59, *cruenta*, p. 60, *staphyloma*, p. 62, *anthracina*, p. 311, *mucida*, p. 312, *infernalis*, p. 318, S. Brazil, *hepatica*, p. 52, *graphica*, p. 74, Rio de Janeiro, *leucogramma*, p. 53, *rotifera*, p. 56, *tetraspilota*, p. 57, *nodifrons*, p. 58, *3-virgata*, p. 69, *paradoxa*, p. 76, *heterospila*, p. 299, *leucocycla*, p. 311 (? = *patricialis*, G., ♂), *subuliventris, angustiventris*, p. 313, *psilogastra*, p. 327, *caelestis*, p. 328, Bogotá, *pardalis, patricialis, superba*, p. 54, New Granada, Bogotá, *hecate*, Costa Rica, *cræsus*, Xalappa, p. 57, *argyrospila*, p. 59, *funebria*, p. 75, Minas Geraes, *cerasina*, p. 59, *cometa, pythagorea*, p. 61, *amabilis*, p. 63, *trinacria*, p. 68, *hoplites*, p. 300, Paraná, *multicolor*, p. 61, *signativentris*, p. 328, Venezuela, *argyrocephala*, Island St. Jean, *hamatodes*, Monte Video, p. 63, *microphthalma, cardinalis*, p. 64, *satrapa*, p. 65, *temporalis*, p. 66, *suspensa*, p. 299, *semirubra, leporina*, p. 314, *ardens, fulviventris*, p. 323, Mexico, *plagiata*, p. 65, *æquinotialis*, p. 71, *pulicaria*, p. 301, *acutangula*, p. 310, *selligera*, p. 319, Columbia, *dissoluta*, p. 66, Carthagena, Bogotá, *tetrastigma*, p. 69, Monte Video, *vitelligera*, p. 71, Peru, *spilota*, p. 73, *trifida*, p. 327, Surinam, *miniata*, p. 75, *protuberans*, p. 318, Catamarca, *diabolica*, Rosario, *mæsta*, Bahia, p. 76, *suavissima*, p. 302, S. Chili, *corpulenta*, p. 311 (? = *spinosa*, Swed., ♂), *musculus*, p. 320, *terminalis*, p. 323, Rio de Janeiro, *dasyppyga*, p. 313, New Friburg, *disjuncta*, p. 321, Paraná, *ægrola*, p. 321, Mendoza, *polydora*, p. 325, Buenos Ayres.

Mutilla pungens, p. 407, *insidiator* [-trix], *petulans*, p. 408, spp. nn., F. Smith, Tr. E. Soc. 1874, Hiogo.

Agama albipes, sp. n., E. T. Cresson, Tr. Am. Ent. Soc. v. p. 99, Nevada.

DORYLIDÆ.

Dorylus shuckardi, sp. n., C. Ritsema, Tijdschr. Ent. xvii. p. 182, Lower Guinea.

FORMICIDÆ.

FOREL, AUGUSTE. Les Fourmis de la Suisse: Systématique, Notices anatomiques et physiologiques, Architecture, distribution géographique, nouvelles expériences et observations de mœurs. N. Denk. schw. Ges. (3) vi. pp. i.-iv., 1-452, i.-v., pls. 1 & 2.

A voluminous account (based upon Mayr's work) divided as follows:—

general external structure; classification (by genera and species, in separate tables founded on the characters of male, female, and workers); description of new forms; synonymy from Mayr & Roger, and of Huber's & Ebrard's species; anatomical and physiological notices including monstrosities; architecture or structure of nests and their adjuncts, and also of other operations of ants; geographical distribution in Switzerland; importance in the scale of nature; observations on habits (brief reference to parasites); consideration of ants on the Darwinian hypothesis; and bibliography. The plates contain figures of various portions of internal and external anatomy. The author's excessive prolixity renders any abstract almost impossible; he nevertheless complains of the length of Traherne-Moggridge's observations [91 pages, 8vo; Forel's own being 500, 4to!], which, according to him, add nothing to those of Lespès (Rev. Cours. Sci. 1866). The worker of *Brachymyrmex*, Mayr, the ♂ of *Ponera punctatissima*, Rog. (p. 92), and the ♂ of *Temnothorax recedens*, Nyl. (p. 94), are described. The author also describes "*Leptothorax luteus*, nov. stirps" (worker), and "*Leptothorax tubero-nigriceps*, form. interm." (with the statement that the males of *L. tubereum*, F., and *L. nigriceps*, Mayr, are not yet described), p. 95. A new genus and two new species are also described (in several parts of the work). The following are considered as merely races:—*Camponotus æthiops*, Latr., of *sylvaticus*, Ol.; *C. ligniperdus*, Latr., of *herculeanus*, L.; *Lasius alienus*, Först., of *emarginatus*, Ol., *brunneus*, Latr., of *niger*, L.; *L. mixtus*, Nyl., *affinis*, Schk., *bicornis*, Först., of *umbratus*, Nyl.; *Formica gagates*, Latr., *cinerea*, Mayr, *rufibarbis*, F., of *fusca*, L.; *F. pratensis*, Deg., *truncicola*, Nyl., of *rufa*, L.; *F. pressilabris*, Nyl., of *exsecta*, Nyl.; *Myrmica lævinodis*, *ruginodis*, *scabrinodis*, *rugulosa*, *sulcinodis*, and *lobicornis*, Nyl., of *rubra*, L.; *Leptothorax muscorum*, Nyl., *flavicornis*, Emery, of *acervorum*, F.; and *L. corticalis* and *interruptus*, Schk., *affinis* and *nigriceps*, Mayr, *unifasciatus*, Latr., *nylanderi*, Först., of *tubereum*, F.

Moggridge's observations reproduced; G. Rochette, Arch. sci. nat. (n. s.) l. pp. 49–69, pl. i.

Stridulating apparatus in ants, situate in the abdominal rings, in both sexes. Landois, 31 Generalversammlung Nat. Ver. preuss. Rheinl.; Ausland, 1874, p. 820.

An analytical description of the European species (translated from Mayr), for the use of collectors of myrmecophilous insects, of which a classified list is also given; E. André, R. Z. (3) ii. pp. 152–235, pl. iii.

Camponotus ligniperdus, Latr., *Lasius fuliginosus*, Latr., and *L. niger*, L., occur in Japan; F. Smith, Tr. E. Soc. 1874, pp. 402 & 403.

Formica fuliginosa. Re-described fully, ordinary nests figured, and a very curious nest described and figured; L. Maggi, Atti Soc. Ital. xvii. pp. 64–98, pls. iii.–vi.

Formica flava. Observations on its habits, with deduction that the parents poison their young in certain cases in order to save them from a life of imprisonment [!]; T. G. Gentry, Canad. Ent. vi. pp. 63–67.

Myrmica ruginodis; habits of a colony, E. F. Elwin, Sci. Goss. 1874, pp. 58–60.

Myrmica levinodis; hermaphrodite described and figured (from England); F. Smith, Ent. Ann. 1874, p. 147, frontisp. fig. 3.

Myrmica molefaciens, "the Agricultural Ant"; economy described by G. Lincecum, Am. Nat. viii. pp. 513-517. "Sweet-scented Ants" and "Robber Ants"; *id. l. c.* p. 564.

Myrmecocystus mexicanus. Habits at Santa Fé described. The honey is not discharged into receptacles, but contained in the abdomen, which is sometimes ruptured by the strain. The intestine is seen winding through the distension. O. Loew, Am. Nat. viii. pp. 365 & 366.

Aphænogaster structor. Observations on beetle parasites, and on this ant being often fed upon by trap-door spiders, &c.; J. T. Moggridge, P. E. Soc. 1874, p. v.; Bull. Soc. Ent. Fr. (5) iv. p. ccxxxix.

Eciton. The habits of the "Foraging Ants" of Central America (*E. predator* and *hamata*) fully described; T. Belt, "The Naturalist in Nicaragua," pp. 17-29.

Ecodoma. Leaf-cutting ants also discussed; *id. tom. cit.* pp. 71-84; nest figured, p. 80. The author believes that the leaves are used as manure (p. 79), on which grows a minute fungus upon which they feed (this opinion partially corroborated by F. Müller, Nature, x. p. 102). Corrosive sublimate is useful for destroying them.

Anergates, g. n., Forel, *l. c.* p. 93. Heads the *Myrmicides*. No worker. First joint of pedicel not cubic; scapular nervure joining the marginal immediately after the spot, and not re-appearing. Type, *Myrmica atratula*, Schenck (parts of external anatomy figured, pl. i. figs. 12-14).

Camponotus vitiosus, sp. n., Smith, Tr. E. Soc. 1874, p. 403, Hiogo.

Polyrhachis lamellidens, sp. n., *id. ibid.*, Hiogo, Hong Kong.

Tapinoma flavipes, sp. n., *id. l. c.* p. 404, Hiogo.

Brachymyrmex heeri, sp. n., Forel, *l. c.* p. 92, pl. i. fig. 17, ? tropical America; from orchids in the tropical garden at Zurich (worker only).

Ponera solitaria, sp. n., Smith, *l. c.* p. 404, Hiogo.

Aphænogaster aciculata, sp. n., *id. l. c.* p. 405, Hiogo.

Ischnomyrmex famelicus, sp. n., *id. ibid.*, Hiogo.

Leptothorax congruus, sp. n., *id. l. c.* p. 406, Hiogo.

Monomorium intrudens, sp. n., *id. ibid.*, Hiogo.

Phidole fervida, p. 406, *nodus*, p. 407, spp. nn., *id. l. c.* Hiogo.

Strongylognathus huberi, sp. n., Forel, *l. c.* p. 94, worker, Valais.

Cremastogaster laboriosa, sp. n., Smith, *l. c.* p. 407, Hiogo.

CHRYSIDIDÆ.

F. Smith, Tr. E. Soc. 1874, pp. 451-471, revises *Cleptes*, *Parnopes*, *Anthracias*, *Pyria*, and *Stilbum*. On *Anthracias*, cf. also P. E. Soc. 1874, p. xvii. *Stilbum splendidum*, Dahlb., nec F., = *amethystinum*, F., ex. typ., and occurs in Australia and Japan; *id.* Tr. E. Soc. 1874, pp. 398 & 470.

Chrysis cuprata, Klg., is probably parasitic on *Celonites apiformis*; J. Lichtenstein, Bull. Soc. Ent. Fr. (5) iv. p. lxvi.

Cleptes aurora, sp. n., Smith, *l. c.* p. 452, Ega.

Parnopes smaragdina, sp. n., *id. l. c.* p. 453, Cape of Good Hope.

Chrysis daphne, p. 399, *Hiogo*, *artifex*, p. 456, *volatilis*, *janthinus*, *fossulatus*, p. 459, *shanghaiensis*, p. 460, *principalis*, p. 461, *varicolor*, p. 462, N. China, *faustus*, p. 456, *reversus*, *viridifrons*, *interceptor*, p. 457, *intrudens*, *parallelus*, p. 458, *imperiosus*, p. 460, *gemmatus*, *agilis*, p. 461, *bipartitus*, *festinus*, p. 462, Australia; *id. l. c.* spp. nn.

Pyria violacea and *proteus*, spp. nn., *id. l. c.* p. 465, Australia.

ICHNEUMONIDÆ.

L. PROVANCHER, Nat. Canad. v. (1873) pp. 435-452, 470-477, vi. pp. 29-32, 55-63, 78-81, 103-107, 143-151, 173-179, 200-205, 279-285, 298-301, 331-336, commences a descriptive account of the species of Quebec, including many new. After a general account, an analytical table of genera is given.

Ichneumonides.

Chasmodes motatorius and *lugens*, Gr., *Exophanes occupator* and *hilaris*, Gr., *Ichneumon pisorius*, L., and *I. coqueberti*, Wesm., figured with details, and general observations made; S. v. Vollenhoven, Pinacographia, pp. 4 & 5, pl. ii. figs. 1-4, 6 & 7.

TISCHBEIN, S. E. Z. xxxv. pp. 104-110, 133-144, 288-303, completes his synopsis of the European species of *Ichneumon*, Wesm. (438 in all), with an account of those occurring at Birkenfeld, and descriptions of new genera and species [Zool. Rec. x. p. 359]. *I. trentepohli*, W., ? = *oscillator*, W., var.; *Amblyteles spoliator*, W., = *palliatorius*, Gr.; *A. 4-cingulatus*, Gr. ?, 8 varieties described; *Psilomastax*, Tischb., re-characterized (p. 296); *P. pyramidalis*, Tischb., = *lapidator*, F., ♀, and 5 varieties, bred from *Apatura iris*, described; *Automalus albo-guttatus*, Gr., described as swarming in a very restricted place.

Aoplus, g. n., *id. l. c.* p. 137. Between *Ichneumon* and *Hoplismenus*; metathorax without spines. *A. inermis*, sp. n., *id. ibid.*, Birkenfeld.

Rhysaspis, g. n., *id. l. c.* p. 139. Follows *Hoplismenus*. Scutellum strongly elevated, and strongly rugose-punctate; metathorax with two strong spines; antennæ and legs long and thin. *R. rugosus* [-sa], sp. n., *id. ibid.*, Dalmatia.

Ichneumon indictus, p. 105, *rivalis*, p. 110, *invisus*, p. 134, *albibucca*, p. 135, Birkenfeld, *redimitus*, p. 107, Hungary, *importunus*, p. 109, Holstein, Rhine Provinces, *propinquus*, p. 133, Vienna, *holsaticus*, p. 134, Holstein, *id. l. c.*; *I. albidipes*, p. 301, *diversipes*, *lanceolatus*, *insolitus*, p. 302, Japan, F. Walker, Cist. Ent. pt. xi.; *I. generosus*, *cognatorius* (? = *proteus*), p. 387, *doliturus*, *cursorius*, p. 388, *flavitaris*, *virulentus*, *improvidus*, p. 389, *incanescens*, *vexator*, *irritator*, p. 390, *rufitaris*, *dentatus*, *intrudens*, p. 391, F. Smith, Tr. E. Soc. 1874, Hiogo: spp. nn.

Exophanes fulvescens, sp. n., Vollenhoven, *l. c.* p. 5, pl. ii. fig. 5, Rotterdam.

Amblyteles syraensis, p. 143, Syra, Tinos, *flavator*, p. 292, *carbonator*, p. 294, Birkenfeld, *vexillarius*, p. 293, Crefeld, spp. nn., Tischbein, *l. c.*

Trogus arrogans, Smith, *l. c.* p. 293, Hiogo; *T. quebecensis*, L. Provancher, Nat. Canad. vi. p. 335, Quebec: spp. nn.

Joppa canadensis, sp. n., L. Provancher, *l. c.* p. 336, Quebec.

Cryptides.

C. G. THOMSON, Opusc. Ent. (vi.) pp. 589–612, continues his arrangement and description of the Swedish *Crypti*. The new genera from *Mesocryptus* to *Trichocryptus*, mentioned in Zool. Rec. x. p. 361, are fully characterized. *Cryptus caliginosus*, Tasch., nec Grav., is re-named (*Stenocryptus*) *nigriventris*, p. 604.

Cryptus ambulator, *carbonarius*, *basalis*, *penetrator*, p. 392, *punctator*, *maculipes*, ♂, p. 393, F. Smith, Tr. E. Soc. 1874, Hiogo; *C. variator* (and ♀ of *C. maculipes*, Sm., p. 304), F. Walker, Cist. Ent. pt. xi. p. 303, Japan; *C. insignis*, *osculatus*, p. 178, *quebecensis*, *signatus*, p. 179, *varius*, *certus*, p. 200, *nigricornis*, *belangeri*, p. 201, *notatus*, *rufus*, *rufo-annulatus*, p. 202, *mundus*, p. 203, *apicatus*, *latus*, p. 204, Provancher, Nat. Canad. vi., Quebec: spp. nn.

Trichocryptus aquaticus, sp. n., Thomson, l. c. p. 611, Sweden.

Phygadeuon niger, *rubro-cinctus*, *abdominalis*, p. 280, *lucens*, *impressus*, p. 281, *signatus*, *tegularis*, *pubescens*, p. 282, *dubius*, *planus*, *proximus*, p. 283, *terminalis*, *hilaris*, *tuberculifrons*, p. 284, *excavatus*, *dorsalis*, p. 285, spp. nn., Provancher, l. c., Quebec.

Mesochorus saintcyri, *luctuosus*, *canadensis*, spp. nn., *id.* l. c. p. 299, Quebec.

Mesostenus jocosus, *longicornis*, p. 300, *nitidus*, *rufo-tinctus*, p. 301, *id.* l. c. Quebec; *M. (?) laticinctus*, Walker, Cist. Ent. pt. xi. p. 304, Japan: spp. nn.

Ischnocerus bicinctus, sp. n., Walker, l. c. p. 303, Japan.

Hemiteles ruficoxus [-*xis*], p. 331, *scabrosus*, *ovalis*, *semirufus*, p. 332, *tener*, *subspinosus*, *humeralis*, p. 333, *sessilis*, *depressus*, p. 334, spp. nn., Provancher, l. c., Quebec.

Ophionides.

Rhopalosoma. The various opinions as to the affinities of this genus discussed, and *R. poeyi*, Cress., figured; J. O. Westwood, Thesaurus ent. oxon. pp. 130–132, pl. xxiv. fig. 9.

Gravenhorstia picta, Boie, *Anomalon heros*, Wesm., *wesmaeli*, Holm., *amictum*, F., *circumflexum*, L., *cerinops*, Gr., and *xanthopus*, Schr., described and figured in detail, with general observations; S. v. Vollenhoven, Pinacographia, p. 6, pl. iii. figs. 1–8.

Scolobates (?) sp. from Natal, noted and figured; J. G. Wood, "Insects Abroad," p. 398, fig. 194.

New species:—

Ophion pungens, p. 396, *flavo-pictus*, *unicolor*, p. 397, Hiogo, F. Smith, Tr. E. Soc. 1874; *O. nigro-varius*, Provancher, Nat. Canad. vi. p. 104, Quebec.

Thyreodon purpurascens, F. Smith, l. c. p. 395, Hiogo.

Anomalon nigripennis [-*ne*], p. 173, *rufus* [-*um*], p. 174, *canadensis* [-*se*], *exilis* [-*le*], p. 175, Provancher, l. c., Quebec; *A. flavifrons*, p. 395, *insidiator*, p. 396, F. Smith, l. c., Hiogo.

Paniscus appendiculatus, *canaliculatus*, p. 105, *albo-variegatus*, *albo-*

tarsatus, quebecensis, p. 106, *interruptus, seminiger*, p. 107, Provancher, l. c. Quebec; *P. unicolor*, Smith, l. c. p. 396, Hiogo.

Campoplex flavipennis, p. 143, *unicolor, politus, lucens*, p. 144, *nigripes, vicinus*, p. 145, *marginatus*, p. 146, Provancher, l. c., Quebec; *C. albimanus*, F. Walker, Cist. Ent. pt. xi. p. 306, Japan.

Sagaritis ventralis, Walker, l. c. p. 307, Japan.

Charops (?) *luteipes*, id. *ibid.*, Japan.

Limneria argentea, hyalina, parva, p. 147, *fusiformis, infumata, flavipes*, p. 148, *rufipes, macrocephala*, p. 149, Provancher, l. c., Quebec.

Macrus dentatus, id. l. c. p. 150, Quebec.

Atractodes cloutieri, p. 150, *rufipes, scapiphorus* [scapo-], p. 151, id. . c., Quebec.

Cremastus rectus, p. 175, *angularis*, p. 176, id. l. c., Quebec.

Exetastes albitarsis and *rufus*, id. l. c. p. 78, Quebec.

Arotes superbus, id. l. c. p. 81, Quebec.

Banchus formidabilis, flavo-variegatus, p. 61, *inermis, pallescens*, p. 62, *insignis*, p. 63, id. l. c., Quebec.

Tryphonides.

Bassus latatorius, F., *albo-signatus*, Gr., *nemoralis*, Holm., *multicolor, lateralis, cinctus, pectoratorius*, and *biguttatus*, Gr., figured with details and general observations; S. v. Vollenhoven, Pinacographia, pp. 3 & 4, pl. i. figs. 1-8.

Mesoleptus stygius, F. Walker, Cist. Ent. pt. xi. p. 306, Japan; *M. muelleri* (A. White), A. G. Butler, Zool. Voy. Ereb. & Terr. ii. p. 27, New Zealand: spp. nn.

Bassus monticola, Vollenhoven, l. c. p. 4, pl. i. fig. 9, Switzerland (? = *biguttatus*, Gr., var.); *B. bouleti, pectoralis*, p. 32, *amœnus*, p. 55, *albicoxus* [-*zis*], *belangeri, pallipennis*, p. 56, *ichneumonoides, elongatus*, p. 57, *areolatus, costalis*, p. 58; spp. nn., Provancher, *tom. cit.* vi., Quebec.

Metopius peltator, sp. n., T. A. Marshall, Ent. Ann. 1874, p. 130, Milford Haven.

Pimplides.

E. T. Cresson, Tr. Am. Ent. Soc. iii. [1870; cf. Zool. Rec. x. p. 359] pp. 143-172, describes the following new genus and species found in America north of Mexico, some being from Walsh's MS. Tables of the known species are also given, and a list with references and some synonyms (pp. 169-172).

Euxorides, p. 167. Distinguished from *Xorides*, Gr., by the front wing having a triangular, sub-petiolated areolet, the head being more transverse, but less broad behind the eyes, the face wider beneath, and the posterior legs proportionally shorter and more robust. *E. americanus*, *ibid.*, Connecticut, Texas.

Acenites rupinsulensis, p. 143, Illinois.

Ephialtes perlongus, Massachusetts, *albipes*, New Jersey, *ibid.*

Epimecis wilti, *ibid.*, Ohio.

Pimpla maura, texana, p. 145, Texas, *atricoxalis*, *ibid.*, Hudson's Bay Territory, *aquilonia*, *ibid.*, Maine, *ontario* [!], p. 146, Canada, *picticornis*,

ibid., New Jersey, *novita*, ibid., Massachusetts, *indagatrix*, ibid., *annulicornis*, *alboricta*, p. 147, *rufispectus*, *notanda*, p. 148, *rufo-variata*, p. 149, Pennsylvania, *incompleta*, p. 147, Illinois, *scriptifrons*, p. 148, Delaware. *Polysphincta texana*, p. 149, Texas, *burgessi*, ibid., *limata*, p. 150, Massachusetts.

Clistopyga annulipes, p. 150, Massachusetts.

Glypta tuberculifrons, p. 152, *longiventris*, *militaris*, p. 154, *rufo-fasciata*, p. 158, and *G. (?) parva*, p. 155, Illinois, *G. erratica*, p. 152, *rufiscutellaris*, p. 153, *simplicipes*, p. 156, various Northern States, *inversa*, p. 153, Massachusetts, *pulchripes* (? = *Anomalon divaricatum*, Say), ibid., *monita*, p. 155, *virginiensis*, p. 157, W. Virginia, *animosa*, New York, *vulgaris*, E. and Middle States, p. 154, *scitula*, p. 155, New Jersey, *rubripes*, p. 156, *canadensis*, p. 157, *macra*, *borealis*, p. 158, Canada, *albo-marginata*, p. 157, Maine, *coloradensis*, Colorado, *dakota* [!], Dakota, p. 158.

Schizopyga frigida, p. 159, Hudson's Bay Territory.

Arenetra nigrita, Canada, *rufipes*, Maine, p. 159, *ventralis*, p. 160, New York.

Cylloceria occidentalis, p. 160, Connecticut, Illinois.

Lampronota occidentalis, *scutellaris*, *pleuralis*, p. 161, *pulchella*, *insita*, p. 162, *parva*, *punctulata*, *tegularis*, *macra*, p. 163, *varia*, *americana*, *exigua*, *agilis*, p. 164, *exilis*, *rubrica*, *coloradensis*, p. 165, various N. American States, some also from Canada, *laevigata*, p. 162, from Canada only, and *L. (?) jocosa*, p. 162, Illinois.

Meniscus elegans, p. 165, various States, *mirabilis*, p. 166, Massachusetts.

Phytodietus vulgaris and *distinctus*, p. 166, various States.

Xorides borealis, p. 167, Hudson's Bay Territory.

Xylonomus australis, p. 167, Louisiana, Texas, *frigidus*, Hudson's Bay Territory, *albo-pictus*, New York, p. 168.

Odontomerus vicinus, p. 168, Massachusetts, *bicolor*, p. 169, Pennsylvania.

Coleocentrus quebecensis, sp. n., L. Provancher, Nat. Canad. vi. p. 79, Quebec.

Macrus apicifer, sp. n., F. Walker, Cist. Ent. pt. xi. p. 305, Japan.

Tropistes elegans, sp. n., Provancher, l. c. p. 80, Quebec.

Acanitus flavipes, sp. n., id. ibid., Quebec.

Thalessa quebecensis, sp. n., id. op. cit. v. p. 447, Quebec.

Pimpla destructor and *luctuosa*, spp. nn., F. Smith, Tr. E. Soc. 1874, p. 394, Hiogo.

Polysphincta vicina, *rubricapensis*, p. 470, *bruneti*, p. 471, spp. nn., Provancher, op. cit. v., Quebec.

Cylloceria lemoinii, sp. n., id. l. c. p. 471, Quebec.

Glypta ruficornis, id. l. c. p. 473, Quebec; *G. albicoxa*, F. Walker, l. c. p. 304, Japan: spp. nn.

Lissonota semistriata, sp. n., Walker, l. c. p. 305, Japan.

Lampronota marginata, p. 474, *albifacies*, p. 475, *nigricornis*, *humeralis*, p. 476, spp. nn., Provancher, op. cit. v., Quebec.

Meniscus crevieri, p. 29, *superbus*, p. 30, spp. nn., id. op. cit. vi. Quebec.

Eucerus quebecensis, sp. n., id. l. c. p. 30, Quebec.

Phytodietus zonatus, sp. n., *id. l. c.* p. 79, Quebec.

Echthrus mellipes, *id. l. c.* p. 60, Quebec; *E. atrator*, Walker, *l. c.* p. 306, Japan: spp. nn.

Xylonomus lavalensis, Provancher, *l. c.* p. 59, Quebec; *X. investigator*, Walker, *l. c.* p. 397, Hiogo: spp. nn.

BRACONIDÆ.

Pelecyctoma luteum, Nees, *Petalodes unicolor*, Wesm., *Heterogamus dispar*, Curt., *Rhogas dissector & reticulator*, Nees, *dimidiatus & bicolor*, Spin., *circumscripatus*, Nees, *tristis* and *irregularis*, Wesm.; figured with detail, and general observations; S. v. Vollenhoven, *Pinacographia*, pp. 6 & 7, pl. iv. figs. 1-11.

The Swedish genera and species allied to *Sigalphus* described by C. G. Thomson, *Opusc. Ent.* (vi.) pp. 553-588.

Apanteles placidus, Hal., parasitic on spiders in Scotland; P. Cameron, Jr., *Ent. M. M. x.* p. 211.

Microgaster from Brazil; F. Walker, *Ent.* vii. p. 207.

Bracon aureo-maculatum [-us], J. G. Wood, "Insects Abroad," p. 404, fig. 199 [colours briefly noted, no locality given]; *B. maculifrons*, p. 177, *corallinus*, p. 179, pl. xi. fig. 1, C. Ritsema, *Tijdschr. Ent.* xvii., S. W. Africa; *B. semiluteus*, F. Walker, *Cist. Ent.* pt. xi. p. 307, Japan: spp. nn.

Spathius fasciatus, sp. n., F. Walker, *l. c.* p. 307, Japan.

Hecabolus cinctus, sp. n., *id. l. c.* p. 308, Japan.

Sigalphus collaris, p. 557, N. W. Sweden, *glypturus*, p. 559, Småland, *striola*, p. 560, Sweden, *luteipes*, p. 561, Gottland, Thomson, *l. c.*, spp. nn.

Chelonus buccatus, p. 565, *intermedius*, p. 567, *bidentulus*, *breviventris*, p. 568, *brachyurus*, *luteipes*, p. 569, *macrocerus*, p. 570, *rugigena*, *humilis*, p. 571, *depressus*, p. 576, *rimulosus*, *caudatus*, p. 577, *antennalis*, *atripes*, *mucronatus*, p. 578, *rugicollis*, *pilicornis*, p. 580, Scandinavia, *id. l. c.*; *C. diversus*, Walker, *l. c.* p. 308, Japan: spp. nn.

Proterops basalis, sp. n., Walker, *ibid.*, Japan.

Ascogaster leptopus, p. 584, *cavifrons*, p. 585, *gibbiscuta*, p. 586, *sternalis*, p. 587, *lapponicus*, p. 588, Scandinavia, Thomson, *l. c.*, spp. nn.

Agathis atricornis, sp. n., F. Smith, *Tr. E. Soc.* 1874, p. 398, Hiogo.

EVANIIDÆ.

J. O. Westwood. 'Thesaurus entomologicus oxoniensis' (Oxford: 1874, fo.), re-describes and figures *Trigonalys lugubris*, Westw., fig. 4, *ornata*, Smith, fig. 7, p. 123, *jucunda*, W., fig. 8, *thwaitesi*, fig. 9, p. 124, and *pictifrons*, Sm., fig. 6, p. 125, pl. xxiii.; *Aulacus nobilis*, W., fig. 4, *formosus*, W., fig. 5, and *A. (Aulacus) mærens*, W., fig. 6, p. 129, and *Nomadina smithi*, W., p. 130, fig. 7, pl. xxiv.

The following new genus and species are described:—

Ophonellus, p. 128. Abdomen long, compressed, and curved, as in *Ophon*, but allied to *Stephanus* in the retuse apex of its metanotum and

obliterated discoidal and apical nervures. *O. fragilis*, *ibid.*, pl. xxiv. fig. 3, Amazon Region, Brazil.

Trigonalya lachrymosa, fig. 5, p. 123, Mindanao, *marginata*, fig. 10, p. 124, Venezuela, pl. xxiii.

Monomachus antipodalis, p. 126, pl. xxiv. fig. 1, Melbourne.

Stephanus damellicus, fig. 2, Australia, *natalicus*, fig. 8, Natal, p. 127, *salamonis*, p. 128, New Hebrides, pl. xxiv.

CHALCIDIDÆ.

G. MAYR, Verh. z.-b. Wien, xxiv. pp. 53-142, describes the European *Torymides* biologically and systematically. A list is given, pp. 57-62, of plants, in the galls, abnormal growths, or fruits of which the various species live, and pp. 62 & 63, of insects on which some of them are parasitic. Nine genera are admitted, of which one is new. *Monodontomerus dentipes*, Boh., var. n. *laricis*, Austria, p. 72. Much synonymy is given. An abstract by F. Walker, Cist. Ent. pt. xi. pp. 325-337.

J. O. WESTWOOD, Thes. ent. oxon., re-describes and figures *Polistomorpha surinamensis*, Westw., p. 133, fig. 2, *sphegoides*, Walk., p. 134, fig. 1, pl. xxv.; *Metomorpha leucaspidioides*, Walk., p. 136, pl. xxv. fig. 8; *Eudoxinna* (nearest to the *Eurytomides*) *transversa*, Walk., pl. xxv. fig. 9; *Theocolax formiciformis*, Westw., p. 138, pl. xxv. fig. 11; *Philomides paphius*, Hal., p. 138, pl. xxvi. fig. 1; *Pelecinella phantasma*, W., p. 142, pl. xxvi. fig. 8; *Thaumas[i]ura terebrata*, W., p. 143, pl. xxvi. fig. 9; *Solenura telescopica*, W., p. 143, pl. xxvi. fig. 10; *Eucharissa speciosa*, W., *ibid.* pl. xxvii. fig. 3; *Eucharis adscendens*, *volusus*, and *zalates*, details p. 151, pl. xxviii. figs. 13-15; *Schizaspidia furcifera*, Westw., p. 151, pl. xxviii. fig. 2, *plagiata*, Walk., p. 152, fig. 11; *Thoracantha apta*, Walk., fig. 3, *flavicornis*, Walk., fig. 4, p. 153, *aculeata*, Westw., fig. 9, p. 154, pl. xxviii.; *Eucharis deprivata*, Walk., p. 155, pl. xxviii. fig. 6.

Euchalcis vetusta, Duf., is parasitic on an *Osmia*; J. Lichtenstein, Pet. Nouv. vi. p. 388; Bull. Soc. Ent. Fr. (5) iv. p. lxxv.

New genera and species :—

Holaspis, Mayr, l. c. p. 83. Allied to *Torymus*; hinder tibiæ toothed, head and thorax coarsely rugose-punctuate. *H. kiesenwetteri*, *ibid.*, Trieste, *apionis* (from *Apion apricans*, on *Trifolium pratense*), *stachidis* [*stachyos*] (galls of *Stachys sylvatica*), Austria, p. 84, *carinata*, p. 85, Piesting, *annonica*, p. 86, Pesth, and *Torymus militaris*, Boh.

Chaetospila [Chæ-], Westwood, l. c. p. 137. Close to *Ceratocephala*, differing in the short peduncle to the abdomen and 8-jointed antennæ; the junction of the sub-costal vein and costa with fascicles of short erect bristles. *C. elegans*, *id. ibid.*, pl. xxv. fig. 10 (? N. America).

Euchrysia, *id. l. c.* p. 139. No differential characters given. *E. clept[o]idea*, pl. xxvi. fig. 3, *gemma*, fig. 4, p. 139, Adelaide, *prasina*, p. 140, N. Australia, *id. l. c.*

Polychroma [Dejean, *Coleoptera*, 1833], *id. l. c.* p. 140. Allied to *Chalcodectes*. *P. histrionica* [-cum], pl. xxvi. fig. 6, ? Brazil, *regalis* [-le],

fig. 7, Amazon region, 16-dentata[-tum], Brazil, p. 141, 7-dentata[-tum] Amazon region, cuprescens, Melbourne, p. 142, *id. l. c.*

Oodera, *id. l. c.* p. 145. Near *Prionopelma*, differing in its raptorial front legs, elongate neck, and eastern locality. *O. gracilis*, *ibid.* pl. xxvii. fig. 9, Aru, *rufimana*, Cambogia, *obscura*, locality unknown p. 146, *id. l. c.*

Belonea, *id. l. c.* p. 146. Near *Oodera*. *B. australica*, pl. xxvii. fig. 5, S. Australia, *femoralis*, fig. 7, New Guinea, *ibid.*, *brevicaudata*, p. 147, Mysol, *id. l. c.*

Polistomorpha fasciata, *id. l. c.* p. 134, pl. xxv. fig. 3, Amazon region.

Leucaspis darlingii[-giana], p. 134, fig. 4, Australia, *cupreoviridis*, fig. 5, New Granada, *regalis*, fig. 6, Luzon, *anthidioides*, fig. 7, Amazon region, p. 135, *id. l. c.* pl. xxv.

Halticella apicalis, F. Walker, Tr. E. Soc. 1874, p. 400, Hiogo.

Chalcis obscurata (? = *inclinator*, var.), *id. l. c.* p. 399, Hiogo.

Epitranus albipennis, *id. l. c.* p. 400, Hiogo.

Torymus glechomæ, galls of *Aulax glechomæ*, Bozen, p. 90, *eglanterix*, galls of *Rhodites eglanterix*, Austria, p. 100, *igniceps*, p. 103, Saxony and Austria, *artemisia*, p. 105, galls of *Cecidomyia artemisia*, Dobrudscha, *hibernans*, p. 111, oak-galls of *Neuroterus lenticularis*, Saxony, Austria, *hieracii*, p. 112, galls of *Aulax hieracii*, Germany, Austria, *lini*, p. 113, France (from *Linum usitatissimum*), *sodalis*, from *Neuroterus*-galls, Saxony, *pygmæus*, oak-galls of *Cecidomyia subulifex*, Mayr, p. 120, *corni*, p. 121, Vienna (galls of *C. corni*), *socius*, p. 126, France and Austria (*Cecidomyia*-galls on *Pimpinella*, *Pastinaca*, and *Daucus*), *medicaginis*, p. 127, Vienna (leaves of *Medicago falcata*), Mayr. *l. c.*

Monodotomerus strobili, *id. l. c.* p. 67, Lower Austria.

Megastigmus synophri, *id. l. c.* p. 129, in galls of *Synophrus politus*.

Syntomaspis cerri, *id. l. c.* p. 79, galls of *Synophrus politus* and *Andricus singularis*, Austria.

Callimome ebria, p. 58 (from gall of *Lasioptera vitis*, O.-S.), *advena*, p. 59 (galls of *Diastrophus nebulosus*, O. S., and *Asphondyliu rudbeckiæ-conspicua*, O.-S.), *tubicola*, p. 60 (gall of *Cynips quercus-tubicola*), *flavicoxa*, p. 61, and *magnifica*, p. 62 (gall of *Rhodites radicum*, O.-S.), *brevicauda*, p. 62 (gall of *Diastrophus nebulosus*), *chrysochlora*, p. 63 (gall of *R. dichlocerus*, Harr.), *solitaria*, p. 64 (? gall of *R. radicum*), U. S. N. America, chiefly Washington (and other new species indicated), R. Osten-Sacken, Tr. Am. Ent. Soc. iii. (1870); *C. amurensis*, *mediocris*, p. 312, *insolitus*[-ta], *contractus*[-ta], *nanulus*[-la], p. 313, F. Walker, Cist. Ent. pt. xi. Amurland.

Eurytoma generalis, p. 311, *leucoptera*, *longicollis*, p. 312, Walker, *l. c.* Amurland; *E. antica*, *id.* Tr. E. Soc. 1874, p. 401, Hiogo; *E. mellea*, Westwood, *l. c.* p. 139, pl. xxvi. fig. 2, Brazil (*Chalcis promorum*, F., is congeneric with this).

Chryseida [*Chrysideidea*] *amazonica*, Westwood, *l. c.* p. 140, pl. xxvi. fig. 5, Amazon region.

Stilbula peduncularis, *id. l. c.* p. 155, pl. xxviii. fig. 7, S. Australia.

Schizaspidia rudis, fig. 5, S. Australia, *caffra*, fig. 12, Caffraria, p. 152, *S. (?) maculata*, fig. 1, p. 153, Brazil, *id. l. c.* pl. xxviii.

Thoracantha coronata, fig. 10, S. America, *batesella*, fig. 8, Amazon region, *id. l. c.* p. 154, pl. xxviii.

Eucharissa stigmatica, pl. xxvii. fig. 2, *cuprifrons*, p. 144, *Caffraria*, *id. l. c.*

Perilampus selectus, p. 313, *obscurus*, p. 314, F. Walker, *Cist. Ent.* pt. xi. Amurland.

Eupelmus excellens, Westwood, *l. c.* p. 149, note, Para.

Lycisca ignicaudata, p. 148, pl. xxvii. fig. 10, Para, *L. (?) natalensis*, p. 149, fig. 6, Natal, *id. l. c.*

Metapelma gloriosa[-sum], pl. xxvii. fig. 8, Philippine Isles. *rufimana* [-num], Borneo, *taprobanæ*, Ceylon, *obscurata*[-tum], E. India, *id. l. c.* p. 150.

Prionopelma longicaudata[-tum], pl. xxvii. fig. 4, *longicollis*[-le], fig. 1, Para, *id. l. c.* p. 145.

Lamprotatus diffinis, p. 314, *viridipes*, *fulvicornis*, p. 315, Walker, *Cist. Ent.* pt. xi. Amurland.

Semiotus stigmaticus, p. 315, *fulvicornis*, p. 316, *id. l. c.* Amurland.

Pachylarthrus promerus, *id. l. c.* p. 316, Amurland.

Pteromalus obumbratus, p. 316 (also at Nice), *albidivenosus*, *platyphilus*, *consocius*, p. 317, *caligatus*, *megaspilus*, *clavicornis*, *proprius*, p. 318, *placens*, p. 319, *id. l. c.* Amurland.

Heteroxyz tenellus, *id. l. c.* p. 319, Amurland.

Encyrtus longipes, *id. l. c.* p. 319, Amurland.

Eulophus purpurascens, *id. l. c.* p. 320, Amurland.

Pleurotopis obscurellus, *id. l. c.* p. 320, Amurland.

Tetrastichus lepidus, p. 320, *deplanatus*, *amurensis*, p. 321, *id. l. c.* Amurland.

PROCTOTRYPIDÆ.

F. Walker, *Ent.* vii. pp. 4, 25, *et seqq.*, continues his discursive recapitulations of notes on *Oxyura*, with copies of Förster's generic tables and reproductions of Haliday's figures. The *Scelionides*, *Ceraphronides*, *Diapriides*, *Belytides*, *Proctotrypides*, *Helorides*, *Embolemites*, *Bethylides* and *Dryinides*, are very briefly discussed.

Indications of species new to Britain; A. O. Ward, *Ent.* M. M. xi. p. 39.

Galesus cornutus, Pz., *rufipes*, Th., *Aneurhynchus macrotomus*, Först., *ruficornis*, Th., *galesiformis*, Westw., *nodicornis*, Msh., *Paramesius rufipes*. Westw., *tenuicornis*, *elongatus*, and *brachypterus*, Th., figured, with detail, and general observations; S. v. Vollenhoven, *Pinacographia*; p. 8, pl. v. figs. 1-10.

Calyzoa staphylinoides, Westw.; ♂ & ♀ figured, p. 157, pl. xxix. figs. 1 & 2. *Epyris niger*, Westw., fig. 1, *fraternus*, Westw., fig. 2, p. 157, pl. xxx.; *E. niger*, Hal., *nec* Westw., = *subcyaneus*, Hal., is re-named *halidayi*, on account of Haliday's amended name not properly representing the insect's colour [!], p. 158, *id. l. c.* *Pristocera* re-characterized; *P. depressa*, F., pl. xxx. figs. 3 & 4, recorded from England; *P. atra*, Kl., pl. xxxi. fig. 5, pp. 162 & 163. *Mesitius nigriventris*, Dahlb., p. 167, pl. xxxi. figs. a-d. *Bethylus formicarius*, Audouin (*nec* Panz., *nec* Jur.),

is referred to *Goniozus*, Thoms., and re-named *audouini* [Panzer's insect is a *Ceraphron*, and Jurine's a *Homalus*; consequently this re-naming is not required], p. 168. *Scleroderma*; male characters added to generic formula, pp. 169 & 170. *S. contractum*, Westw., ? = *Pristocera atra*, ♀. J. O. Westwood, Thesaurus ent. oxon.

S. C. Snellen van Vollenhoven, Versl. Ak. Amst. (2) viii. pp. 150-162, pl., discusses the affinities of the genera allied to *Dryinus*, uniting *Gonatopus* with that genus, and *Chelogyne* with *Antæon*. A new species is described and figured, and figures of *D. formicarius* and *Myrmecomorphus rufescens* are reproduced.

Gonatopus ptinorum; a parasite on *Ptinus fur*, at Montpellier, thus named. Both sexes (♂ winged) reared; Giraud had considered a *Bethylus* to be the ♂ of this species, of which the ♀ appears to have been observed before. J. Lichtenstein, Bull. Soc. Ent. Fr. (5) iv. p. xxx.

New genera and species :—

Eupsenella, Westwood, l. c. p. 168. No differential characters given. *E. agilis*, id. *ibid.* pl. xxx. fig. 6, N. W. Australia.

Apenesia, id. l. c. p. 170. ♂ unknown; 4th joint of maxillary palpi deformed, legs strong, antennæ 13 jointed; apterous. *A. amazonica*, id. l. c. p. 171, pl. xxxi. fig. 12, Amazon region, and *Scleroderma modestum*, Sm.

Loboscelidia [? *Loboscelidoidea*], id. l. c. p. 171. Dubiously referred to the *Diapriides*, and stated in some respects to approach the *Cynipidæ*. *L. rufescens*, id. l. c. p. 172, pl. xx. fig. 13, Sula.

Aleria, T. A. Marshall, Ent. M. M. x. p. 209. Between *Telenomus* and *Anteris* in Förster's *Scelionides*, having the *ramus stigmaticus* (cubitus) thickened at the base, so as to resemble a stigma. Facies of *Scelio* and *Sparasion*. *A. flavibarbis*, id. *ibid.*, Corsica.

Triogmus, id., Ent. Ann. 1874, p. 134. *Ceraphronides*; with 3 distinct longitudinal sutures on the mesothorax. *T. furcifer*, id. l. c. p. 135, England.

Epyris sæva, pl. xxxi. fig. 6 (? England), *lathrobioides*, pl. xxix. fig. 7, Ceylon, p. 158, *muscarius*, fig. 8, Amazon region, *platycephalus*, fig. 9, N. Australia, *piceiventris*, fig. 10, Melbourne, p. 159, *eganus*, pl. xxx. fig. 4, and *eganellus*, pl. xxxi. fig. 4, Ega, *smithanus*, Brazil, *aurichalceus*, pl. xxxi. fig. 3, Cuba, p. 160, *amazonicus*, pl. xxx. fig. 9, Amazon region, *fabricii*, S. America, p. 161, *serricollis*, pl. xxx. fig. 10, S. W. Africa, and *E. (?) nasalis*, pl. xxxi. fig. 2, Brazil, p. 162, Westwood, l. c.; *E. crassicornis*, F. Walker, Cist. Ent. pt. xi. p. 309, and *apicalis*, id. Tr. E. Soc. 1874, p. 402, Japan.

Pristocera columb[i]ana pl. xxix. fig. 5, Columbia, *crassicornis*, fig. 6, Amazon region, *drewseni*, pl. xxxi. fig. 7, Ceylon, p. 164, *fulvicollis*, pl. xxix. fig. 3, Amazon region, *ruficaudata*, fig. 4, Natal, *burchellana*, pl. xxx. fig. 8, Brazil, p. 165, *hemorrhoidalis*, pl. xxx. fig. 7, p. 166, Brazil; Westwood, l. c.

Mesitius carceli, p. 166, pl. xxxi. fig. 9, "in Oriente," *rufithorax*, fig. 11, ? Italy, and *halidayi*, fig. 8, Italy, p. 167, *halidayellus*, p. 168, Italy; id. l. c.

Goniozus antipodum, Westwood, l. c. p. 169, pl. xxxi. fig. 1, Adelaide.
Scleroderma sidneyana[-num], id. l. c. p. 170, pl. xxxi. figs. 13 & 14, Albania.

Isobrachium maculipenne, T. A. Marshall, Ent. M. M. x. p. 222, Corsica.

Perisemus hyalinus, id. Ent. Ann. 1874, p. 133, England.

Dryinus corsicus, id. Ent. M. M. x. p. 207, Corsica; *D. spectrum*, Volenhoven, l. c. p. 159, Haarlem, figs. 3 & 4.

CYNIPIDÆ.

Mayr's 'Mitteleuropäischen Eichengallen' curtly abstracted and translated, with copies of the figures, and notes by E. Newman and F. Walker on the parasites and inquilines of the different galls discussed, &c. (no new observations are made); Ent. vii. pp. 1, 50, 73, 98, 193, 217, 241, 265, *et seqq.* The same author's monograph on the *Synergi* of the oak-galls abstracted by F. Walker, Cist. Ent. pt. x. pp. 271-278:

Cynipidæ new for the fauna of Zwickau, and a monstrosity in *Trigonaspis megaptera*, Pz., described and figured; D. H. R. von Schlechtendal, JB. Ver. Zwickau, 1872 [1873], pp. 9-11, 11 & 12, pl. figs. 1-1d.

Species near London and their parasites; A. O. Ward, Ent. M. M. xi. p. 39.

Dryocosmus cerriphilus, Gir., *Aphilothrix globuli* and *callidoma*, Hart., and *A. albo-punctata*, Schl.; galls and parasites described from England. E. A. Fitch, Ent. M. M. xi. p. 109. *A. sieboldi* bred in England; H. Moncreaff, Ent. vii. p. 93.

Cynips quercus-palustris, O.-S., contains a small free cocoon-like substance, in which the pupa rolls, formed of vegetable matter; double galls also noticed. R. Osten-Sacken, Tr. Am. Ent. Soc. iii. (1870), p. 52.

Parasites on American species; id. l. c. p. 57, *et seq.*

Diplolepis quadrum. Gall on oak caused by this species described and figured; G. Bertoloni, Mem. Ac. Bologn. (*cf.* Pet. Nouv. vi. p. 406).

Cynips quercus-notha, p. 55, New York (shows no perceptible difference from *C. q.-palustris*), & *q.-echinus*, p. 56, California, R. Osten-Sacken, l. c., spp. nn.

Liopterum bifasciatum, pl. xx. fig. 12, *nigripenne*, *fuscicorne*, *abdominale*, p. 132, *apicale*, *subpetiolatum*, *clavicorne*, *unifasciatum*, p. 133, spp. nn., J. O. Westwood, Thes. ent. oxon., Amazon region.

Rhodites japonica, sp. n., F. Walker, Cist. Ent. pt. xi. p. 309, Japan.

Synergus japonicus, sp. n., id. *ibid.*, Japan.

UROCERIDÆ.

Oryssus plumicornis, Guér., p. 118, fig. 2, *maculipennis*, Smith, p. 119, fig. 5 (var. ? described from Mindanao), *unicolor*, Latr., fig. 6, *sayi*, Westw., fig. 7, p. 120, re-described and figured; J. O. Westwood, Thes. ent. oxon. pl. xxii. *Brachyxyphus*, Philippi, = *Derecyrta*, Smith; the supposed ♀ of *B. grandis* is a ♂, and the true ♀ is described, id. l. c.

pp. 121 & 205. *D. pictipennis*, Sm., re-described and figured; *id. l. c.* pp. 121 & 122, pl. xxiii. fig. 2.

Xiphydria orientalis, p. 112, pl. xx. fig. 10, E. India, *walshi*, p. 113, New York, *id. l. c.*, spp. nn.

Sirex fulvo-cinctus, fig. 1, *latifasciatus*, fig. 2, *gracilis*, fig. 4, p. 114, *dimidiatus*, fig. 5, *morio*, fig. 6, *abaddon*, fig. 7, p. 115, *melancholicus*, fig. 8, p. 116, N. America, *id. l. c.* pl. xxi.; *S. japonicus*, F. Smith, Tr. E. Soc. 1874, p. 386, Hiogo: spp. nn.

Urocerus tricolor, sp. n., Provancher, Nat. Canad. i. (1869), p. 17, Canada; ? = *cresoni*, var., Norton, Tr. Am. Ent. Soc. ii. p. 357; this opinion doubted, the ♂ described, and ♀ and larva figured, L. Provancher, Nat. Canad. iii. pp. 77 & 78, fig. 10.

Tremex pandora, fig. 9, E. Indies, *maurus*, fig. 3, N. America, p. 116 pl. xxi., *rugicollis*, pl. xx. fig. 9, Philippine Isles, *purpureipennis*, Malacca p. 117, Westwood, *l. c.*, spp. nn.

Oryssus imperialis, p. 118, fig. 1, Gold Coast; *batesianus*, fig. 3, *fulvi stigma*, p. 4, p. 119, *amazonicus*, p. 121, fig. 8, Amazon Region, *id. l. c.* pl. xxii., spp. nn.

Derecyrtia bicolor, fig. 1, Chili (= *grandis*, Phil., p. 205), *lugubris*, fig. 3, Brazil, *id. l. c.* p. 122, pl. xxiii. spp. nn.

TENTHREDINIDÆ.

Cimbex venusta, Pty. The type, agreeing with description, = *C. betulæ*, Zadd., = *sylvarum*, Pz.; and an error in the reference to Brazil of any such form is suggested. Kriechbaumer, S. E. Z. xxxv. pp. 417 & 418.

Tenthredinidæ mentioned in E. Taschenberg's paper, "Die dem Wein- und Obstbau schädlichen Insecten," Verh. Ver. Rheinl. xxix. (1872) pp. 170-177.

Tenthredinidæ new for the fauna of Zwickau, including *Allantus consobrinus*, Kl., var. n. *zwickaviensis* (p. 5), with observations on other species, on variations in neuration, fungoid growth on larvæ, &c. D. H. R. von Schlechtendal, JB. Ver. Zwickau, 1872 [1873], pp. 2-9.

Tenthredinidæ occurring at Rannoch (Scotland); P. Cameron, Jr., Scot. Nat. ii. pp. 358 & 359. *Nematus croceus* and *pallipes*, Fall., *obductus* and *mollis*, Htg., *histrio*, Lep., *Dineura stilata*, Klg., *Selandria grandis*, Zadd., *Pæcilosoma obtusum*, Thoms., *Strongylogaster mixtus*, Klug, and *Hoplocampa pectoralis*, Thoms., new to Britain; *Nematus cinerea*, Retz., bred from hairy galls on *Salix cinerea*; *id. Ent. M. M.* x. pp. 211, 278, xi. p. 65. *Cenoneura dahlbomi*, Thoms., ♂, and economy of *Taxonus glabratus*, Fall., p. 108; *T. equiseti*, Fall., Scotch var. connecting *T. coxalis*, Kl., and ? also *T. sticticus*, p. 129; *id. op. cit.* xi. *Nematus wittevaali*, Voll., and *Blennocampa aterrima*, Kl., new to Britain, pp. 202 & 274; *Nematus virescens*, Htg., p. 196, and *Athalia rosæ*, L., p. 197, described as larva and imago from Scotch specimens; *id. Scot. Nat.* ii.

Hylotoma pagana, Pz., *Tenthredo scalaris*, Kl., and ? *Cephus 5-fasciatus*, Steph., from Japan; F. Smith, Tr. E. Soc. 1874, pp. 376 *et seq.*

Nematus ventricosus; habits in Canada described by W. Saunders, Canad. Ent. vi. pp. 101-104; L. Provancher, Nat. Canad. vi. pp. 186-192.

Nematus latipes and *Selandria annulipes*; Vollenhoven's 'Life-histories' translated by J. W. May, Ent. vii. pp. 252 & 267.

Abnormal wing-neuration in *Selandria serva* and *Tenthredo instabilis*; S. v. Vollenhoven, Tijdschr. Ent. xvii. Versl. p. lxxvii.

Perantherix, g. n., J. O. Westwood, Thes. ent. oxon. p. 109. Approaches *Pterygophorus* in the enlarged scapulæ of the collar, and in the single marginal cell and three submarginal cells, but allied to *Hylotoma* in its appendiculated marginal cell and the spur in the middle of the 4 hind tibiae. Antennæ 6-jointed, with a long apical seta. *P. pumilio*, sp. n., id. ibid. pl. xx. fig. 1, Amazon region.

Brachytoma [Swainson, *Mollusca*], g. n., id. ibid. Next to *Lophyrus*. *B. nigriceps*, ibid., fig. 2, *fumipennis*, fig. 3, *picea*, fig. 6, Amazon region, and *vitellina*, fig. 5, Brazil, p. 110, pl. xx., spp. nn., and (*B.*) *melanoptera*, Pty.

Hylotoma nigritarsis, *imperator*, *humeralis*, p. 374, *ephippiata*, *simillima*, *similis*, p. 375, *3-notata*, *captiva*, p. 376, spp. nn., F. Smith, Tr. E. Soc. 1874, Japan.

Nematus graminis, P. Cameron, Ent. M. M. x. p. 221, Gt. Britain. *N. alnivorus*, id. op. cit. xi. p. 107, Scotland; *N. vollenhoveni*, id. Scot. Nat. ii. p. 296, all stages, Scotland: spp. nn.

Selandria nigriceps, sp. n., F. Smith, l. c. p. 376, Hiogo.

Eriocampa testaceipes, sp. n., P. Cameron, Ent. M. M. xi. p. 128, Scotland.

Strongylogaster iridipennis, sp. n., F. Smith, l. c. p. 377, Hakodadi.

Pachyprotasis erraticus, sp. n., id. ibid., Hakodadi.

Macrophya nigro-picta, p. 377, *vexator*, *apicalis*, *pacifica*, p. 378, *ferox*, *ignava*, p. 379, *irritans*, *carbonaria*, *timida*, *luctifera*, p. 380, *flavipes*, p. 381 spp. nn., id. l. c., Japan.

Taxonus glottianus, sp. n., P. Cameron, Ent. M. M. xi. p. 220, Scotland.

Tenthredo coccinocerus, J. G. Wood, "Insects Abroad," p. 388, fig. 188, Darjeeling [colours briefly mentioned]; *T. erratica*, p. 381, Hakodadi, Siberia (? = *flavicornis*, climatic var.), *providens*, *hilaris*, p. 382, *volatilis*, p. 383, Japan, F. Smith, l. c.: spp. nn.

Dolerus ephippiatus, *fuscipennis*, p. 383, *subfasciatus*, *nigro-cæruleus*, p. 384, spp. nn., F. Smith, l. c., Japan.

Lyda volatilis, *venustus*[-ta], p. 384, *latifrons*, p. 385, id. l. c., Japan; *L. frontalis*, p. 110, fig. 7, *apicalis*, p. 111, fig. 8, pl. xx., N. America, Westwood, l. c.: spp. nn.

Cephus 4-guttatus, Westwood, l. c. p. 111, pl. xx. fig. 11, Massachusetts; *C. viator* (? = *5-fasciatus*, Steph.), p. 385, *agilis*, p. 386 Smith, l. c., Japan: spp. nn.

LEPIDOPTERA.*

BY

W. F. KIRBY, M.E.S., &c.

GENERAL NOTES.

Parts 89-92 of W. C. Hewitson's "Exotic Butterflies"; parts 19 & 20 of A. G. Butler's "Lepidoptera Exotica" (completing the work); part 2 of C. Ward's "African Lepidoptera"; parts 1 & 2 of vol. ii. of W. H. Edwards' "Butterflies of N. America"; parts 8-11 of H. Strecker's "Lepidoptera"; and parts 8 & 9 of R. H. Stretch's "Illustrations of *Zygænide* and *Bombycide* of North America" (completing vol. i.) have appeared within the year.

Lee's Coloured Specimens to illustrate the Natural History of Butterflies (London: 1806); noticed by A. G. Butler, P. E. Soc. 1874, pp. xx. & xxi.

J. Hübner's "Tentamen determinationis digestionis atque denominationis singularum stirpium Lepidopterorum," &c., a very rare tract, hitherto almost unknown to Lepidopterists, has been reprinted in facsimile by S. H. Seudder.

R. Felder & A. F. Rogenhofer have published "Reise der Oesterreichischen Fregatte Novara. Lepidoptera, Heft iv. Atlas der Heterocera, Sphingida-Noctuida" (Wien: 4to, Nov. 1874, pls. lxxv.-cxxx., and pp. 537-548). Pp. 537-548 contain the index to the *Rhopalocera* already published; pls. lxxv.-cvii. have names at foot; pls. cviii.-cxxx. have each a page of explanation, including names, localities, and diagnoses of new genera. Additional text to pls. lxxv.-cvii. is promised with Heft v., which is to conclude the work. Large numbers of the *Bombyces* are figured under new generic names, and in the absence of text the Recorder will not answer for their being always correctly enumerated under the proper families in the following pages. He has indicated all the genera known to him with an asterisk; the others are presumably new. Some of the species figured may be *Geometreæ*; but, as this group

* The Recorder wishes to explain, that although he retains the arrangement followed in previous volumes of the Record for convenience of reference, yet he does not wish to be understood as thereby expressing any opinion as to recent alterations in the classification of *Lepidoptera*.

is not supposed to be included, and the author's views cannot be known until the text is published, it has been thought better to enumerate them among the *Bombyces*, with which they are associated. The insects figured under certain known generic names (e.g., *Lomaspilis* and *Noctuo-morpha*) appear to have no relation to the species commonly included in those genera. The above remarks are not intended to apply to pls. lxxv.-cvii., which contain *Noctuæ*.

On alleged discrepancies between the catalogues of Kirby and Staudinger, cf. W. F. Kirby, *Canad. Ent.* vi. pp. 196 & 197.

O. Staudinger (SB. Ges. Isis, 1873, pp. 77-79; B. E. Z. xviii. pp. 148-150) classes the different kinds of variation in *Lepidoptera* as follows:—I. Aberrations, or Accidental Variations. II. Local Varieties, or Races. III. Variation in broods appearing at different seasons. IV. Variation from difference in food of larvæ. V. Variation due to Hybridism. VI. Dimorphism and Polymorphism. In conclusion, he alludes to Mimicry.

A. R. Grote discusses the functions of the antennæ in *Lepidoptera*. He considers them to be organs both of smell and hearing, and thinks that in the butterflies, which fly by day, and in which sight is well developed, they have become modified by disuse. *Am. Nat.* viii. pp. 519 & 520.

Remarkable cases of mixed or partial hermaphroditism are described and mostly figured by Westwood, *Thesaurus ent. oxon.* [antea, p. 243], pp. 185-189, pl. xxxv. The following species are noticed:—*Pieris pyrrha*, fig. 1; *Euchloe cardamines*, figs. 3 & 4; *Anthocharis evippe*, figs. 11 & 12; *Gonepteryx rhamni*, fig. 3; *Siderone isidore*, figs. 6 & 7; *Hipparchia semele*, fig. 13; *Morpho sulcowskii*; *Polyommatus adonis*, fig. 5; and *Lasiocampa quercus*.

T. G. Gentry, "Influence of Nutrition on Sex among the *Lepidoptera*," P. Ac. Philad. 1873, pp. 281-283, deduces the following important conclusions from experiments on the larvæ of several of the larger N. American moths:—(1.) When the larvæ are fed on diseased or innutritious food, males result. (2.) When the leaves on which the larvæ feed have lost their usual amount of sap in the autumn, males result. (3.) Late in the season, more males than females are produced. (4.) Difference of sex is brought about late in larval life, through the medium of nutrition.

On controlling sex in butterflies; variation in larvæ, &c.; W. V. Andrews, *Canad. Ent.* vi. pp. 145-147.

On migration of butterflies; H. Reeks, *Ent.* vii. pp. 110-112.

On the groups of *Lepidoptera*, and on the coloration and patterns of butterflies; H. H. Higgins, *Synopsis of Invertebrate Animals in the Liverpool Museum*, pp. 87-96 (P. Liverp. Soc. xxviii. App.).

Mimicry in butterflies and pupæ; T. Belt, *Naturalist in Nicaragua*, p. 382.

Oviposition of certain *Lepidoptera*; P. H. Jennings, *Ent.* vii. pp. 285-287.

On gall-producing *Lepidoptera*; E. L. Ragonot, *Bull. Soc. Ent. Fr.* (5) iv. pp. ccxlv. & ccxlv. (23 species enumerated).

A moth from West Africa, with a proboscis strong enough to inflict a severe puncture; S. J. McIntire, *M. Micr. J.* xi. pp. 196 & 197. [Probably a *Noctua*, allied to *Ophioderes*.]

Shrivelling of wings in *Lepidoptera*; O. Wilson, *Ent.* vii. p. 13.

On the food of various larvæ; T. Goossens, *Pet. Nouv.* vi. p. 404. On some North American larvæ; *id.* *Bull. Soc. Ent. Fr.* (5) iv. p. cccxxxi.

On rearing larvæ; J. R. S. Clifford, *Ent.* vii. pp. 208 & 209.

On preserving caterpillars by inflation (with woodcuts of apparatus); S. H. Scudder, *Canad. Ent.* vi. pp. 107-111; *Am. Nat.* viii. pp. 321-326.

Note on birds destructive to injurious caterpillars in N. America; A. J. Cook, *Am. Nat.* viii. p. 368.

On species which pass the winter as larvæ or pupæ; Wiesenhütter, *S. E. Z.* xxxv. pp. 226-230.

On the transmission of pupæ; B. Smith, *Ent. M. M.* x. p. 256.

Notes on collecting; G. Norman & G. M. Dodge, *Canad. Ent.* vi. pp. 19, 114 & 115.

Many popular notices on *Lepidoptera* (chiefly British) with occasional good woodcuts, and notes on collecting, setting, preserving, &c., will be found in *Sci. Goss.*, 1874.

Palæarctic Region.

PRAUN, S. V. *Abbildung und Beschreibung europäischer Schmetterlings-Raupen.* Heft i. Stuttgart: 1874. [Not seen by the Recorder.]

Captures of European Butterflies; F. A. Walker, *Ent.* vii. pp. 75-79.

For a very important and philosophical analysis of the geographical distribution of European butterflies, cf. E. Hofmann, *Württ. Nat. J.H.* xxix. pp. 255-304, pls. i. & ii. He recognizes three principal faunas in Europe, the Glacial, Mediterranean, and Siberian. At the glacial period, nearly all the butterflies were driven out of Europe, the greater portion into Asia, and a few into Africa, from whence they subsequently returned, when the climate again became warmer. The bulk of the existing species are evidently thus derived from Asia. (Analysis and remarks; L. Quaedvlieg, *CR. Ent. Belg.* xvii. pp. xlvii.-liv. Discussion; pp. liv., lv., lxvii. & lxviii.)

A list of European Butterflies of which the larvæ are known, with food-plants noticed, compiled from Kaltenbach's *Pflanzenfeinde*; S. H. Scudder, *Canad. Ent.* vi. pp. 21-25, 126 & 127.

Short notes on *Acherontia atropos*, *Teniocampa stabilis*, *Carpocapsa grossana* (larva figured), *Crambus pratorum* (egg figured), and *Pterophorus pterodactylus*; H. Weijenbergh, *Tijdschr. Ent.* xvii. pp. 168-170, pl. ix. figs. 34 & 35.

Great Britain.

Captures at Forres by J. B. Blackburn, *Ent. M. M.* x. pp. 178 & 179; in North Wales, by H. Jenner-Fust, *tom. cit.* pp. 179-180; at Sheppey, by A. Hodgson, *tom. cit.* p. 180; in S. Wales, by J. T. D. Llewellyn, *tom. cit.* pp. 276 & 277; at Grange-over-Sands and Witherslack, by J. B. Hodgkinson, *op. cit.* xi. pp. 19 & 85; in the New Forest, by B. Lockyer, *tom. cit.* pp. 158 & 159, *Ent.* vii. pp. 138 & 139; at Glenarm, in 1873, by

T. Brunton, Ent. vii. p. 43; in E. Sussex, by W. H. Tugwell, *tom. cit.* pp. 160 & 161; in N. Kent, by G. T. Porritt, *tom. cit.* pp. 180 & 181; at Dry Drayton (butterflies), by F. A. Walker, *tom. cit.* pp. 198-202; in Sutherlandshire, by C. L. Adams, *tom. cit.* p. 207; at Eastbourne by G. B. Shearwood, *tom. cit.* p. 224; at Ardrishaig, by H. Jenner-Fust, Scot. Nat. ii. p. 203; at Castle Douglas and in Kirkcudbrightshire, by W. D. Robinson-Douglas, *tom. cit.* pp. 300, 359 & 360.

F. B. White has continued his list of the *Lepidoptera* of Scotland, from *Cirrhædia* to *Hadena*; Scot. Nat. ii. pp. 225-232, 281-284, 321-328, 369-378.

Short notes on Scotch *Lepidoptera*, by F. B. White and others; *tom. cit.* p. 276.

H. G. Knaggs, in "Notes on new and rare British *Lepidoptera* (excepting *Tineina*) for 1873," Ent. Ann. 1874, pp. 149-160, records three species new to Britain.

Additions to the list of *Macro-Lepidoptera* of Guernsey & Sark; W. A. Luff, Ent. vii. pp. 42 & 43.

On the *Lepidoptera* of Alderney, *id. l. c.* pp. 10-12.

C. G. Barrett publishes a list of 1240 *Lepidoptera* found in Norfolk: Tr. Norw. Soc. 1873-1874. Suppl. pp. 80. His observations are both of local and general interest. The *Micro-Lepidoptera* are (as usual) imperfectly known. Many *Lepidoptera* formerly taken in the county have become extinct. Several insects usually abundant on chalk, occur singly, and appear to be either struggling to obtain a footing in this locality, or dying out. Several northern species occur in this county [which renders more probable the occurrence of others, reputed to occur, but doubted by the author, such as *Ctenonympha davus*], and various coast sand-hill species are found on the singular stretch of post-glacial sea-sands at Thetford, Brandon, and neighbourhood.

France.

Captures at Cernay-la-Ville, by Berce & Rattet, Bull. Soc. Ent. Fr. (5) iv. p. cxvii.; at Dunkerque, by Goossens & Le Roy, *tom. cit.* p. cxxviii.; in the mountains of Cantal, by A. Guénée, *tom. cit.* pp. clxv.-clxviii.

E. Berce has published vol. 5 of his 'Faune Entomologique Française: Lépidoptères', containing the *Geometridæ* (Paris: 1873, 12mo, pp. x. 512, pls. D & xliii.-lviii.). No new species are described. Also a 'Catalogue méthodique des Lépidoptères de France décrits dans la Faune Française' (p. 37), as a general index, completing the work.

On a few French *Lepidoptera*; Fétig, Pet. Nouv. vi. p. 404.

Holland.

List of *Lepidoptera* new to the fauna; De Graaf & Snellen, Tijdschr. Ent. xvii. pp. 225-228.

Additions to list of *Macro-Lepidoptera* of Breda and environs; F. J. M. Heylaerts, *tom. cit.* pp. 173 & 174.

Belgium.

Captures, including species new to the fauna; CR. Ent. Belg. xvii. pp. v., vi., lxvii., lxxx., xciv.-xcvii., xcix., & cii.-cv.

Denmark.

Catalogue of species, *Rhopalocera* to *Tortricidæ*; A. B. Haas, Nat. Tids. (3) ix. pp. 377-567.

Sweden and Norway.

List of 285 *Noctuæ* (including *Deltoidæ*) and 237 *Geometræ*; H. D. J. Wallengren, Index specierum Noctuarum et Geometrarum in Scandinavia hucusque detectarum. Stockholm: 1874, 8vo, pp. 37. Bihang till Sv. Ak. Handl. (2) iv. The preliminary remarks (in Latin) relate chiefly to the distribution of the species within the district to which the pamphlet refers.

Germany.

MEURER, F. Schmetterlinge der Umgegend von Rudolfstadt in systematischer Reihenfolge, nebst Notizen über die Fundorte, die Erscheinungszeit der Schmetterlinge und Raupen, die Nahrungspflanzen, &c. Rudolfstadt: 1874, 8vo. [Not seen by the Recorder.]

List of 653 *Macro-Lepidoptera* found in the immediate neighbourhood of Hanover; C. T. Glitz, JB: Ges. Hannov. xxiv. pp. 24-69.

A. Fuchs enumerates the most remarkable *Lepidoptera* found in the upper part of the valley of the Wisper, and on the neighbouring mountains, including 4 species new to Nassau. JB. Nass. Ver. xxvii. & xxviii., pp. 172-183.

List of *Macro-Lepidoptera* of Lübeck; A. W. Paul, Ent. vii. pp. 154-159.

For Galician *Lepidoptera*, see *antea*, p. 245.

Italy.

A. Curó has published an attempt at a catalogue of the *Lepidoptera* of Italy (Bull. Ent. Ital. vi. pp. 3-26, 106-123, 201-218, 315 & 316), comprising the *Rhopalocera*. A good list of authorities is given. Italy is treated geographically, rather than politically, and taken to include the whole southern slope of the Alps, and also Corsica. Four zones of distribution are recognized, the North, Central, Southern, and Insular, the last including Corsica and Sardinia; and tables are given, showing the number of species belonging to each family of *Lepidoptera* which occur in each zone, as well as the total number found in Italy and Europe. Italy possesses 1511 *Macro-* and 1312 *Micro-Lepidoptera*, out of the 2381 and 2600 known European species; but the Italian *Micro-Lepidoptera* are not well known at present. The remarks in the body of the paper on varieties, larvæ, &c., are of more than local interest.

List of *Rhopalocera* taken near Modena, and represented in the local Museum; A. Carruccio, *tom. cit.* pp. 69-82.

Switzerland.

Captures in the Alps by O. Struve, S. E. Z. xxxv. pp. 189-202.

Catalogue of the *Sphinges* and *Bombyces* of Switzerland; H. Frey & J. Wullschlegel, MT. sch. ent. Ges. iv. pp. 201-278. Their remarks on each species are chiefly of local interest.

Russia.

Captures near St. Petersburg ; N. Erschoff, *Hor. Ent. Ross.* x. p. 194.

J. G. Schilde continues his "Lepidopterologische Mittheilungen aus Nord-Finnland," *S. E. Z.* xxxv. pp. 57-77, from the *Sphinxes* to the *Geometrae* inclusively ; and sums up the contents of his collection (pp. 76 & 77).

Asia.

N. G. Erschoff has published a monograph of the *Lepidoptera* collected by the late A. Fedchenko in Turkestan (St. Petersburg : 1874, 4to, pp. vi. 128, 6 col. plates) [*antea*, p. 250]. 367 species are recorded. A table is given at the end, showing the altitudes at which the various species were taken, and their range throughout the world. The work is printed entirely in Russian, except Latin diagnoses of the new species (Review : H. F. Feild, *Hor. Ent. Ross.* x. pp. i.-iv.).

Notes on Japanese butterflies ; R. P. Murray, *Ent. M. M.* xi. pp. 166-168.

Ethiopic Region.

List of 55 butterflies (6 new) captured by Lieut. A. S. Bell, on the march to Coomassie ; W. C. Hewitson, *Ann. N. H.* (4) xiii. pp. 380-383.

Indo-Malayan Region.

F. Moore publishes a list of 103 species of Diurnal *Lepidoptera* collected in the Cashmere Territory by Capt. R. B. Reed, and describes some new species ; P. Z. S. 1874, pp. 264-274, pl. xliii.

Captures in the Island of Banka by Teysmann, *Pet. Nouv.* vi. pp. 403 & 404.

List of 79 species of butterflies collected by L. Layard in Siam (6 new) ; H. Druce, *P. Z. S.* 1874, pp. 102-109, pl. xvi.

List of 49 butterflies collected by Capt. Wimberley in the Andaman Islands (5 new) ; W. C. Hewitson, *Ann. N. H.* (4) xiv. pp. 356-358.

Austro-Malayan Region.

C. Hopffer, "Beitrag zur Lepidopteren Fauna von Celebes," *S. E. Z.* xxxv. pp. 17-47, enumerates 165 species (127 butterflies) collected by A. B. Meyer, and describes many as new.

List of the Diurnal *Lepidoptera* of the South Sea Islands ; A. G. Butler, *P. Z. S.* 1874, pp. 274-291, pl. xlv.

W. H. Miskin criticises Masters' "Catalogue of the described Diurnal *Lepidoptera* of Australia," making many additions and corrections ; *Tr. E. Soc.* 1874, pp. 241-246.

New Zealand.

A. G. Butler has published a "Catalogue of the *Lepidoptera* of New Zealand" (London : 1874, 4to, pp. 25, 3 pls.). Also issued as part of the Zoology of the Voyage of H.M.S. Erebus & Terror (pp. 28-51, pls. viii.-x.) [*antea*, p. 239]. 318 species are recorded, of which 9 are butterflies. The plates chiefly represent hitherto unfigured species. Only one genus and one species are described as new.

List of *Lepidoptera* recorded as found in New Zealand previous to 1871; R. W. Fereday, Tr. N. Z. Inst. vi. pp. 171-182.

Nearctic Region.

Captures in Western America (butterflies) by G. R. Crotch; W. H. Edwards, Tr. Am. Ent. Soc. v. p. 15. At Galena, Illinois (butterflies in 1872-73); T. E. Bean, Ent. M. M. x. pp. 248-251. In Anticosti by W. Couper; A. R. Grote, Bull. Buff. Soc. i. p. 185, and Grote & Couper, Canad. Ent. vi. pp. 33-37, 55-59, 69-72, & 91-96. At St. Catharine's, Canada, by G. Norman; Grote, Canad. Ent. vi. p. 117. Essex County, Canada, by F. C. Lowe, *tom. cit.* p. 140; in New York State, by J. A. Lintner,* Rep. N. Y. S. Mus. xxvi. pp. 166, 167, 177-184; at White Mountains (butterflies), by S. H. Scudder & H. K. Morrison, Psyche, i. pp. 13, 14, 18, 19, 25 & 26; at Cliftonville and Wyoming, by Morrison, *l. c.* p. 16; at Amherst, Mass., by H. W. Parker (butterflies), *op. cit.* p. 26; at Newton, Mass., by R. Thaxter (*Sphingidæ*), *op. cit.* pp. 29 & 30.

List of butterflies collected by Lieut. W. L. Carpenter, during the U. S. Survey of Colorado, 1873 (41 spp.); W. H. Edwards, Hayden's Rep. U. S. Survey, 1873, p. 542 [*antea*, p. 246].

List of butterflies (28 species, 1 new) collected by J. A. Allen during the Yellowstone Expedition of 1873; S. H. Scudder, P. Bost. Soc. xvii. pp. 86-91.

A. R. Grote enumerates the moths figured in Emmon's "Agriculture of New York," vol. v. 1854: Bull. Buff. Soc. ii. pp. 164-168. It appears to be a popular work of the most worthless kind.

On the Distribution of Insects in New Hampshire; S. H. Scudder, Final Report on the Geology of New Hampshire, chapt. xii., pp. 331-384, plate and maps. A list of 85 butterflies, with copious remarks on their distribution, is given at pp. 344-362. *Orthoptera* are the only other insects discussed in this paper.

English names proposed for New England butterflies; *id.* Psyche, i. pp. 2, 3, 10, 11, & 31. Cf. also J. Behrens & A. R. Grote, *tom. cit.* pp. 9, 10, & 14.

On the geographical distribution of the moths of Colorado, with notes on known species, and descriptions of a few new ones; A. S. Packard, Hayden's Rep. U. S. Survey, 1873, p. 542, plate.

Notes on Californian *Lepidoptera*; A. Kefenstein, Z. ges. Naturw. (2) xliv. pp. 222-229.

H. B. Möschler has published a "Beitrag zum Schmetterlings-Fauna von Labrador," S. E. Z. xxxv. pp. 153-166, describing several new species, &c.

On various butterflies and moths of Anticosti; H. Strecker, *Lepidoptera*, pp. 69, 70, & 79.

Argynnis polaris and *chariclea*, *Colias hecla*, *Larentia polata*, *Geometra* sp., and *Dasychira* sp. n., recorded from E. Greenland by A. v. Homeyer in "Die zweite deutsche Nordpolarfahrt" (Leipzig: 1874, 8vo), ii. pp. 406-410. (Observations by Herrich-Schäffer & Wocke).

* Lintner's Entomological Contributions, pt. 3, are recorded in the present vol. of Zool. Rec.; pt. 2 has not yet reached the Recorder.

Neotropical Region.

W. C. Hewitson has published "Descriptions of new species of butterflies collected by Mr. Buckley in Bolivia" (London : 1874, 8vo, pp. 22). 52 species.

List of 180 butterflies (10 new) collected by C. Van Volxem in Brazil, in 1872, with dates, localities, &c.; J. B. Capronnier, Ann. Ent. Belg. xvii. pp. 5-39, pl. 1.

List of butterflies of Costa Rica (434 species, some new); Butler & Druce, P. Z. S. 1874, pp. 330-370.

Habits of Nicaraguan butterflies; T. Belt, "Naturalist in Nicaragua" [*antea*, p. 247], pp. 108 & 109. On the migrations of *Timetes*, *Callidryas*, and *Urania*, *id. l. c.* pp. 152-154.

Captures in South America; G. F. Mathew, Ent. vii. pp. 62-66.

PAPILIONIDÆ.

Ornithoptera pompeus, var. *hephaestus*, Feld.; C. Hopffer, S. E. Z. xxxv. p. 18, n. 2.

H. Edwards describes the transformations of *P. philenor*, *zolicaon*, *asterias*, and *eurymedon*, and the pupa of *P. rutulus*; P. Cal. Ac. v. pp. 162-165.

Papilio anticostensis: immature larva figured; H. Strecker, Lepidoptera, pl. viii. fig. 13. *P. brevicauda* may be the original form from which *P. asterias* is descended; W. Couper, Canad. Ent. vi. pp. 33-37. The larva differs from that of *P. asterias*; W. V. Andrews, *op. cit.* p. 20: *cf.* also A. R. Grote, Bull. Buff. Soc. i. p. 185. *P. castor* and *pollux*, Westw., are quite distinct, and Semper has figured *P. pollux* under the former name; J. O. Westwood, Thes. ent. oxon. p. 185. *P. copanæ*, Reakirt, figured and re-described by H. Strecker, Lepidoptera, p. 61, pl. viii. fig. 1. *P. cresphontes*: deformity in prolegs of a larva; S. H. Scudder, Psyche, i. p. 12. *P. daunus* figured; W. H. Edwards, Butt. N. Amer. ii. *Pap.* pl. ii. *P. eurymedon* figured and described in all stages; *id. l. c. Pap.* pl. i. *P. godarti*, Montr., is distinct from *P. onesimus*, Hew.; A. G. Butler, P. Z. S. 1874, p. 290. *P. hippodamus*, Feld., is quite distinct from *P. servillii*, Godt.; J. A. Boisduval, Bull. Soc. Ent. Fr. (5) iv. pl. cliii. *P. merope* described, and transformations figured by J. P. Mansel Weale, Tr. E. Soc. 1874, pp. 131-136, pl. i. On its different forms, among which the West African form is sufficiently distinct to rank as a species; R. Trimen, *op. cit.* pp. 137-153. *P. nireus*: on the habits of the larva, and the assimilation of the colours of the pupa to the surface to which it attaches itself; M. E. Barber, Tr. E. Soc. 1874, pp. 519-521, pl. ix.: *cf.* also P. E. Soc. 1874, p. xxiv. *P. orabilis* and *clusoculis* figured and re-described by A. G. Butler, Lep. Ex. p. 163, pl. lviii. figs. 1 & 2. *P. pamphylyus*, Feld.; C. Hopffer, S. E. Z. xxxv. p. 18, n. 7. *P. podalirius* does not occur in Russian Turkestan; N. Erschoff, Lep. Turk. p. 1, note. [It occurs in Persia; but its reputed occurrence at Masuri, N. India, requires confirmation.] *P. proteus*, Boisd., noticed; J. B. Capronnier, Ann. Ent. Belg. xvii. p. 8. *P. turnus*: natural history, with figures of larva and imago; W. Saunders, Canad.

Ent. vi. pp. 3-5. Var. from Anticosti; W. Couper, *op. cit.* pp. 97 & 98.

Euphaides glaucus figured; S. H. Scudder, Rep. Geol. N. Hampshire, i. pl. A, fig. 16.

Iphiclide ajax. A good summary of its natural history, polymorphism, &c., given by S. H. Scudder, Am. Nat. viii. pp. 257-267. He also criticises R. Meldola's remarks on its various forms; P. Bost. Soc. xvi. pp. 117-119. Meldola maintains that these criticisms do not invalidate his principal conclusion, viz., that the polymorphic forms do not conform to the law of substance-waste. Ann. N. H. (4) xiv. p. 240.

Laertias philenor figured by S. H. Scudder, Rep. Geol. N. Hampshire, i. pl. A, figs. 15 & 17.

Pyrrhosticta lætitia and *vulnerata* figured and re-described; A. G. Butler, Lep. Ex. pp. 164 & 165, pl. lviii. figs. 4 & 3.

Euryades. On the structure of the ♀ generative organs; H. Burmeister, S. E. Z. xxxv. pp. 427-429. *E. duponcheli*, Luc. ♀ (= *E. reevii*, Westw., olim) described and figured by Westwood, Thes. ent. oxon. p. 180, pl. xxxiv. figs. 1 & 2.

Parnassius clarius, from California, is a var. of the Siberian species; *P. smintheus*, from California, = *P. delius*, var.: P. C. Zeller, S. E. Z. xxxv. pp. 433 & 434. *P. corybas*, F. d. W.: both sexes figured, and re-described at great length by N. Erschoff, Lep. Turk. pp. 2-4, pl. i. figs. 1 & 2. *P. smintheus*, Doubl., = *P. delius*, var. *intermedius*, Mén.; H. Strecker, Lepidoptera, p. 80.

Papilio incandescens, p. 433, pl. vi. fig. 1, Pará, *drucei*, p. 434, pl. vi. fig. 2, Ecuador, *metaphaon*, p. 434, Mexico, *polystictus* (= *protodamus*, var. b. Gray), p. 435, S. Brazil, A. G. Butler, Tr. E. Soc. 1874; *P. charicles*, W. C. Hewitson, Ann. N. H. (4) xiv. p. 356, Andaman Islands; *P. rhodostictus*, Butler & Druce, P. Z. S. 1874, p. 364, Costa Rica; *P. liomedon*, F. Moore, *op. cit.* p. 575, Calicut; *P. sadyattes*, H. Druce, Ent. M. M. xi. p. 36, Costa Rica; *P. lormieri*, W. L. Distant, *op. cit.* p. 129, Madagascar; *P. meyeri*, C. Hopffer, S. E. Z. xxxv. p. 19, n. 8, Celebes: spp. nn.

PIERIDÆ.

H. Edwards (P. Cal. Ac. v. pp. 165 & 166) describes the larvæ and pupæ of *Colias eurytheme* and *Terias nicippe*, and the pupa of *Neophasia menapia*.

Catanticta arechiza, Reak., is distinct from *teutila*, Doubl.; *C. sebennica*, Luc., is the ♀ of the latter. Butler & Druce, P. Z. S. 1874, p. 357.

Terias jageri, Mén., is perhaps the Japanese form of *T. leta*, Boisd., and *T. brenda*, Doubl. & Hew., is perhaps a form of *T. hecabe*; R. P. Murray, Ent. M. M. xi. pp. 166 & 167. *T. rahel*, Fabr.: C. Hopffer still considers *T. drona*, Horsf., to be this species; S. E. Z. xxxv. p. 26 (n. 45). *T. tenella*, var.; J. B. Capronnier, Ann. Ent. Belg. xvii. pp. 13 & 62.

Pieris beckeri, Edw., = *chlorodice*, Hübn.; H. Strecker, Lepidoptera, p. 70. *P. brassicae* and *rapæ*: migration across the Humber into N. Lincolnshire marshes; J. Cordeaux, Ent. vii. p. 161. *P. napi*: Sepp's account of its transformations translated by E. Birchall, Ent. vii.

pp. 271-277. *P. oleracea*, *frigida*, *castorea*, and *virginiensis*, may be vars. of *P. napi*; P. C. Zeller, S. E. Z. xxxv. p. 436. *P. frigida*, Scudd., is an undoubted var. of *P. napi*; H. B. Möschler, *op. cit.* pp. 153 & 154. *P. napi*, vars. *venosa* and *pallida*, Scudd., are noticed and figured by H. Strecker, Lepidoptera, pp. 61-63, pl. viii. figs. 2-5. *P. oleracea*: W. Couper discusses the distinctness of its northern representatives, *P. frigida* and *borealis* (the latter is distinct in its transformations); Canad. Ent. vi. pp. 56-58. *Ganoris oleracea* [= *Pieris oleracea*, *suprà*] figured by S. H. Scudder, Rep. Geol. N. Hampshire, i. pl. A, fig. 8. Var. *borealis*, from Anticosti described; A. R. Grote, Bull. Buff. Soc. i. p. 185. *P. rapæ*: recorded from the Gaboon by W. C. Hewitson, Ent. M. M. xi. p. 16; a variety noticed by E. S. Dashwood & W. D. Robinson Douglas, Ent. vii. pp. 140 & 162; vars. *marginalis* and *novangliæ*, Scudder, noticed and figured by H. Strecker, Lepidoptera, pp. 63 & 64, pl. viii. figs. 6-8.

Tachyris albina, Boisd., and *lycaste*, Feld.: C. Hopffer, S. E. Z. xxxv. pp. 21 (n. 25) & 72 (n. 27).

Callidryas. Five species formerly included in this genus occur in the United States, viz.:—*Phæbis agarithe* (? *argante*, Edw.), Texas; *Callidryas eubule* (*C. drya* is hardly distinct), U. S.; *C. sennæ* (= *marcellina*, Edw.), Texas, Florida; *C. philea* (new to U. S.; a pale var.), Texas; *Metura cipris*, New Mexico. *Pap. pyranthe*, Linn., may be taken as the type of *Murtia*, Hübn., if generically distinct from *Pap. crocale*, Cram. (type of *Catopsilia*). S. H. Scudder, P. Bost. Soc. xvii. pp. 206-209. *C. flava*, Butl., = *crocale*, Cram.; *C. jugurtha*, Cram., is distinct; C. Hopffer, S. E. Z. xxxv. pp. 24 (n. 39).

Gonepteryx rhamni, hermaphrodite; H. Goss. Ent. M. M. xi. p. 113.

Colias. W. H. Edwards, Butt. N. Amer. Col. pl. i., figures *C. nastes*, figs. 1-4, and *pelidne*, figs. 5-8. *C. keewaydin*, = *chrysotheme*, var.; *meadi* = ? *myrmidone*, var.; *eurytheme* is apparently distinct; *alexandra* and *helena* may be vars. of *palæno*; P. C. Zeller, S. E. Z. xxxv. pp. 437 & 438. *C. chrysotheme* (true) occurs in Texas, quite distinct from *eurytheme* and its var. *keewaydin*; H. Strecker, Lepidoptera, p. 100. *C. nastes*, var. *cocandica*, described and figured by N. Erschoff, Lep. Turk. p. 6, pl. i. fig. 3, from Khokand. *C. philodice*, popular history; W. Saunders, Canad. Ent. v. pp. 221-223, figs. 21 & 22; var. from Anticosti, W. Couper, *op. cit.* vi. pp. 92 & 93. *C. pyrrhothea*, Hübn., var. *heliceoides* from Buenos Ayres, described; J. B. Capronnier, Ann. Ent. Belg. xvii. p. 13.

Anthocharis olympia, Edw., and *ausonides*, Boisd., re-described and figured in all stages by W. H. Edwards, Butt. N. Amer. Anth. pl. i. figs. 1-4, 5-8; *A. olympia* is also figured and re-described by H. Strecker, Lepidoptera, pp. 64 & 65, pl. viii. fig. 9.

New species :—

Euterpe suadela, p. 329, Peru, Bolivia, *alena* and *chedonis*, p. 330, Bolivia, *susiana*, *prioneris*, and *zenobina*, p. 331, and *pieris*, p. 332, Peru, C. Hopffer, S. E. Z. xxxv.; *E. amastris*, W. C. Hewitson, Bol. Butt. p. 3, Bolivia.

- Catantixia thessea*, Butler & Druce, P. Z. S. 1874, p. 358, Costa Rica.
Hesperocharis agasicles, W. C. Hewitson, l. c. p. 3, Bolivia; *H. nereina*, C. Hopffer, l. c. p. 336, Peru; *H. antipator*, H. Druce, Cist. Ent. i. p. 285, Vera Pas.
Dismorphia pallidula, Butler & Druce, P. Z. S. 1874, p. 363, Costa Rica.
Leptalis amelina, p. 332, hab. — ?, *pimpla*, Bolivia, and *thermesina*, hab. — ?, p. 333, *penia*, p. 334, Peru; C. Hopffer, l. c.
Terias atinas, W. C. Hewitson, l. c. p. 4, Bolivia; *T. lutimargo*, p. 25, Celebes, *T. pomponia* and *sybaris*, pp. 336 & 337, Peru, C. Hopffer, l. c.; *T. sinoides*, J. A. Boisduval, Ann. Ent. Belg. xvii. p. 61, pl. i. fig. 2, Itaipu.
Pieris eurygonia, p. 23 (n. 36), Togian Island, Celebes, *palæstra*, Peru, and *nephthis*, Peru and Bolivia, p. 334, *erinna* and *menthe*, Peru, p. 335, C. Hopffer, l. c.; *P. eucosmia*, N. Erschoff, Ann. Ent. Russ. viii. pl. iii. fig. 1, Ropaybamba, Peru; *P. van-volxemi*, J. B. Capronnier, Ann. Ent. Belg. xvii. p. 11, pl. i. fig. 1, Buenos Ayres.
Tachyris albata, C. Hopffer, l. c. p. 22, n. 26, Celebes.
Belenois solilucis, A. G. Butler, Tr. E. Soc. 1874, p. 433, Angola.
Nepheronia compacta, id. Cist. Ent. i. p. 234, Central India.
Aphrissa butleri, S. H. Scudder, P. Bost. Soc. xvi. p. 209, Tehuantepec.
Ictias verna, H. Druce, P. Z. S. 1874, p. 108, pl. xvi. figs. 5 & 6, Siam;
I. familiaris, A. G. Butler, Tr. E. Soc. 1874, p. 432, Thibet.
Teracolus chrysomelis, id. Cist. Ent. i. p. 244, Aden.

DANAIDÆ.

- Danaus erippus* new to Celebes; C. Hopffer, S. E. Z. xxxv. p. 32 (n. 64). New to New Zealand (erroneously called *D. berenice*), and reasons adduced for regarding it as an indigenous species; R. W. Fereday, Tr. N. Z. Inst. vi. pp. 183-186. *D. archippus*, var. *brasiliensis*, Boisd. [probably = *D. plexaure*, Godt.], noticed by J. B. Capronnier, Ann. Ent. Belg. xvii. p. 22. *D. philene* var.; C. Hopffer, l. c. p. 33 (n. 66).
Euplexa eleutho var. ♀, Herr. Schöff. (S. E. Z. 1869, pl. ii. fig. 7), is re-named *E. distincta*; A. G. Butler, P. Z. S. 1874, p. 278. *E. vollenhovi*, Feld., re-described; C. Hopffer, l. c. p. 28 (n. 56).
Danaus septentrionis, India, Penang, *microsticta*, Borneo, *leucoptera*, Dorey, p. 163, *exprompta*, Ceylon, *vulgaris*, East Indies, p. 164, A. G. Butler, Ent. M. M. xi.; *D. obscurata*, id. P. Z. S. 1874, p. 275, Upolu: spp. nn.
Amauris hyalites, sp. n., id. Cist. Ent. i. p. 209, Ambriz.
Euplexa meyeri, p. 29, *coracina*, p. 30, *maura*, p. 32, all from Celebes, C. Hopffer, l. c.; *E. layardi*, H. Druce, P. Z. S. 1874, p. 103, pl. xvi. fig. 1, Siam; *E. perryi*, A. G. Butler, op. cit., p. 278, pl. xlv. fig. 1, Nieue, or Savage Island; *E. magnifica*, id. Tr. E. Soc. 1874, p. 423, Thibet: spp. nn.

HELICONIIDÆ.

- Ernicornis*, g. n., J. B. Capronnier, Ann. Ent. Belg. xvii. p. 22. No characterized; type *Pap. euritea*, Cram.

New species.

Dircenna xanthophane and *abendrothi*, C. Hopffer, S. E. Z. xxxv. p. 318, Peru; *Ithomia (Dircenna) euteles*, N. Erschoff, Ann. Ent. Russ. viii. pl. iii. fig. 3, Cayenne.

Ceratinia mestra and *pyrippe*, p. 342, *metella* and *pardalina*, p. 243, C. Hopffer, l. c., Peru.

Napeogenes galinthias, id. l. c. p. 344, Bolivia.

Ithomia aquinia, p. 339, *crispinilla* and *asellia*, p. 340, *airania*, p. 341, C. Hopffer, l. c. Peru; *I. cyrcilla*, *cleomella*, *torquatilla*, and *pupilla*, Bolivia, *crispina*, New Granada, *cytharista*, Peru, *crinippa*, Bolivia, *Ith.* pl. xxxii. figs. 209–215, *I. taliata*, *statilla*, *thira*, *verticilla*, *canilla*, Peru, *ellara*, Bolivia, *beronilla*, New Granada, *Ith.* pl. xxxiii. figs. 216–222, W. C. Hewitson, Ex. Butt. v.

Hymenitis andania, C. Hopffer, l. c. p. 341, Peru.

Melinæa dodona, id. l. c. p. 344, Bolivia.

Tithorea togarma, W. C. Hewitson, Bol. Butt. p. 4, Bolivia; *T. neitha*, C. Hopffer, l. c. p. 337, Peru.

Heliconius favorinus and *dionysos*, id. l. c. pp. 348 & 349, Bolivia; *Heliconia arcuella*, H. Druce, Tr. E. Soc. 1874, p. 156, Nauta; *H. theudela*, W. C. Hewitson, Ent. M. M. x. p. 224, Panama.

ACRÆIDÆ.

Acraea. C. Ward (Afr. Lep. pl. vii.) figures his *A. manandaza*, figs. 1 & 2, *masamba*, figs. 3 & 4, *masonala*, fig. 5, and *A. hova*, ♀, Boisd., fig. 6. *A. orizava*, Reak., = *A. nox*, Bates; Butler & Druce, P. Z. S. 1874, p. 352. *A. eurita*, Hew., Ex. Butt. iv. *Acr.* pl. iv. fig. 26, and pl. v. fig. 31, is re-named *Planema excisa*; A. G. Butler, Cist. Ent. i. p. 212, from Congo.

Acraea byzia and *corduba*, W. C. Hewitson, Bol. Butt. pp. 5 & 6, Bolivia; *A. vinidia*, Angola, and *orina*, p. 130, *oreta*, *oppidia*, and *orestia*, p. 131, Fernando Po, id. Ent. M. M. xi.; *A. acerata*, id. Ann. N. H. (4) xiii. p. 381, Coomassie; *A. crassina*, Peru, *demonica* and *adriana*, Bolivia, p. 345, *mucia*, Peru, *nicylla*, Bolivia, Peru, *aliteria*, p. 346, and *anaxo*, Peru, *athilla* and *eresina*, p. 347, *carbonaria*, p. 348, Bolivia, C. Hopffer, S. E. Z. xxxv.; *A. (Telchinia) pseudolycia*, A. G. Butler, Cist. Ent. i. p. 213, Quantza: spp. nn.

Planema epiprotea (♀ ? = *Acraea eurita*, Hew., fig. 29), Gaboon, p. 210, *metaprotea*, Ambrix, and *monteironis*, Ambrix, Bembe, p. 211, *elongata* (= *Acr. eurita*, Hew., figs. 29 & 30), Gaboon, p. 212, *formosa*, p. 213, Cabinda, Ambrix, id. l. c., *P. antifascia*, p. 427, *pseudoprotea* and *amphiprotea*, p. 428, id. Tr. E. Soc. 1874, Angola, spp. nn.

NYMPHALIDÆ.

H. Edwards (P. Cal. Ac. v. pp. 167–171) describes the transformations of *Melitea chalcodon*, *edita*, and *palla*, *Phyciodes mylitta*, *Grapta satyrus* and *zephyrus*, *Vanessa antiopa* and *milberti*, *Pyrameis huntera*, *cardui*,

and *atalanta*, and *Junonia cenia*; and the pupæ of *Limenitis lorquini* and *californica*.

Cethosia biblis, Dru., var. from Andaman Islands; W. C. Hewitson, Ann. N. H. (4) xiv. p. 356.

Cynthia deione, Erichs., is distinct from *C. arsinoe*, Cram.; C. Hopffer, S. E. Z. xxxv. p. 35.

Argynnis cybele, *aphrodite*, and *diana*: on rearing, W. H. Edwards, Canad. Ent. vi. pp. 121-125. *A. adippe*: E. Newman figures and describes a melanic variety; Ent. vii. pp. 49 & 50. *A. atlantis*, Edw., re-described; H. B. Möschler, S. E. Z. xxxv. pp. 156 & 157. *A. brennerii*, W. H. Edwards, figured and re-described by him; Butt. N. Amer. ii. Arg. pl. iv. *A. edwardsi*, Reak., is quite distinct from *A. aglaia*; P. C. Zeller, S. E. Z. xxxv. p. 439. *A. niobe*: on its occurrence in England, H. Doubleday, Ent. M. M. x. p. 253; H. G. Knaggs, Ent. Ann. 1874, pp. 154 & 155; and various writers in Ent. vii. pp. 171-174, 225 & 226, and 288 & 289.

Brenthis montinus, S. H. Scudder, figured by him; Rep. Geol. N. Hampshire, i. pl. A, fig. 1.

Melitæa asteria, Freyer, is perhaps only an Alpine form of *aurelia*, Nick. (*parthenie*, O.), A. Curó, Bull. Ent. Ital. vi. p. 121. *M. athalia* and *parthenie*; aberrations described and figured by N. Erschoff, Lep. Turk. pp. 15 & 16, pl. i. figs. 11 & 12. *M. artemis*; larva feeding on honeysuckle, H. Goss, Ent. vii. p. 203. *M. picta*, Edw., and *mata*, Reak., figured and re-described; H. Strecker, Lepidoptera, p. 65, pl. viii. figs. 10 & 11. *M. selene*, var. ? figured and described by E. Newman, Ent. vii. p. 97.

Phyciodes fulviplaga, A. G. Butler, figured and re-described by him; Lep. Ex. p. 183, pl. lxiii. fig. 2. *P. nycteis*; notes on young larva, W. H. Edwards, Canad. Ent. v. p. 224.

Eresia dimorphina, A. G. Butler, figured and re-described by him; Lep. Ex. p. 182, pl. lxiii. fig. 1.

Limnæcia harrisi. Notes on larvæ; S. H. Scudder, Psyche, i. p. 18.

Grapta. P. C. Zeller reviews the N. American species; *G. faunus* = ? *c.-album* var.; *G. satyrus* may = *zephyrus*, var.; the larva of *faunus* may have been mistaken for that of *zephyrus*: S. E. Z. xxxv. pp. 440-442. The N. American species also noticed by W. Couper, who thinks that *G. faunus* and *G. gracilis* may be dimorphic forms; Canad. Ent. vi. pp. 94 & 95. *G. c.-album*; two or three species may be confounded under this name, P. C. Zeller, l. c. p. 440. *G. comma* and *dryas* are broods of one species; W. H. Edwards, Canad. Ent. vi. p. 157. *G. gracilis*, G. & R. (? = *zephyrus*, Edw.), figured and re-described by H. Strecker, Lepidoptera, p. 68, pl. viii. fig. 14. *G. oreas*, W. H. Edwards, re-described by him; Tr. Am. E. Soc. v. p. 109. *G. silenus*, W. H. E., figured and re-described by him; Lep. N. Amer. ii. pl. i.

Polygonia progne figured by S. H. Scudder, Rep. Geol. N. Hampshire, i. pl. A, fig. 12.

Papilio. S. H. Scudder defends his selection of *antiopa* as the type; Canad. Ent. vi. pp. 143-145. Cf. also Hagen, op. cit. pp. 163-166.

Nymphalis j.-album, B. & L., attracted by hundreds to a lighthouse at

night ; S. H. Scudder, *Psyche*, i. p. 28. *N. milberti*, Godt. ; note on distribution, H. K. Morrison, *Psyche*, i. p. 4.

Vanessa io : arrested development on left side, caused by accidental detachment of pupa ; A. G. Butler, *P. E. Soc.* 1874, p. xi. *V. urtica*, var. *atrebatensis*, Boisd., = var. *ichneusoides*, De Selys, and similar vars. are discussed ; *CR. Ent. Belg.* xvii. pp. xxxvii.-xl.

Pyrameis cardui, var. *kershawi*, McCoy ; A. G. Butler, *Lep. N. Zeal.* p. 3. *P. gonerilla*, Fab., figured ; *id. l. c.* pl. i. figs. 10 & 11.

Junonia westermanni, J. O. Westwood, re-described and figured by him ; *Thes. ent. oxon.* p. 182, pl. xxxiv. figs. 7 & 8.

Precis hara, Moore, = *wedah*, Koll. ; F. Moore, *P. Z. S.* 1874, p. 269.

Myscelia pattenia, Butler & Druce (? = *cyananthe*, ♀, Feld.), figured and re-described ; A. G. Butler, *Lep. Ex.* p. 172, pl. lx. fig. 1.

Catagramma. On the rarity of females in this genus ; W. C. Hewitson, *Bol. Butt.* p. 2. *C. latona*, A. G. Butler, figured and re-described by him ; *l. c.* p. 183, pl. lxiii. fig. 3.

Ageronia. Both sexes produce a sound in flight ; Van Volxem, *Ann. Ent. Belg.* xvii. p. 21.

Pyrrhogyra aphni, A. G. Butler, figured and re-described by him ; *l. c.* p. 184, pl. lxiii. fig. 5.

Megalura valetta, Butler & Druce, figured and re-described ; A. G. Butler, *l. c.* p. 172, pl. lx. fig. 2.

Diadema bolina : A. G. Butler, *P. Z. S.* 1874, p. 228, divides this into thirteen species, describing some, and merely indicating others as new ; *D. bolina* var., Butl., *Ann. N. H.* (4) v. p. 360, and Brenchley's Cruise of the Curaçoa, p. 468, pl. 48, figs. 3 & 4, from Solomon Islands, is named *D. pallescens*. *D. euryta*, Hew. (fig. 8), is re-named *Pseudacraea metaplanema* ; *id. Cist. Ent.* i. p. 213. *D. octocula*, Butl., has priority over *D. formosa*, H. S. [as the Recorder now admits] ; *id. P. Z. S.* 1874, p. 283.

Euripus hallirothius, Westw., = *Diadema consimilis*, Westw., ♂ ; F. Moore, *op. cit.* p. 270.

Godartia crossleyi, figs. 1 & 2, and *trajanus*, figs. 3 & 4, figured by C. Ward, *Afr. Lep.* pl. viii.

Limenitis disippus ; transformations popularly described and figured by W. Saunders, *Canad. Ent.* vi. pp. 46-49. *L. proserpina* and *arthemis* are probably dimorphous forms of one species ; W. H. Edwards, *Canad. Ent.* v. pp. 232 & 233.

Basilarchia artemis and *disippe*. Notes on habits of larvæ by S. H. Scudder & E. P. Austin, *Psyche*, i. pp. 13 & 14.

Neptis aceris, var. *celebensis* described by C. Hopffer, *S. E. Z.* xxxv. p. 36. *N. biafra*, C. Ward, figured by him ; *Afr. Lep.* pl. ix. figs. 1 & 2. *N. eurynome*, Westw., re-described ; F. Moore, *P. Z. S.* 1874, p. 570. *N. pryri*, A. G. Butler, figured and re-described by him ; *Lep. Ex.* p. 184, pl. lxiii. fig. 4.

Euryphene. C. Ward (*Afr. Lep.*) figures his *E. camarensis*, figs. 3-6, *ribensis*, figs. 7 & 8. pl. ix., *E. comus*, figs. 1 & 2, *nivaria*, figs. 3 & 4, and *porphirion*, figs. 5-8, pl. x.

Harma. O. Ward (*l. c.* pl. xi.) figures his *H. capella*, figs. 1-3, *cyclades*, figs. 4 & 5, and *ciceronis*, figs. 6 & 7.

Adolias laverna, A. G. Butler, figured and re-described by him; Lep. Ex. p. 174, pl. lx. fig. 5.

Apatura lycaon and *herse* are described in all stages by C. V. Riley, Rep. Ins. Mo. vi. pp. 136-150, and Tr. Ac. St. Louis, iii. pp. 193-208; to *lycaon* he refers *celtis* and *alicia*, and to *herse*, *clyton* and *proserpina* as varieties or synonyms, thus admitting but two N. American species of *Apatura*. *A. herse* and *lycaon* of Scudder & Riley (*nec* Fabr.) respectively = *A. clyton* and *A. celtis*, Boisd., and are distinct species; *A. herse* and *lycaon*, Fab., are sexes of one species, and = *A. alicia*, Edw.: A. G. Butler, P. E. Soc. 1874, p. iii. *A. ilia*; on its supposed occurrence in England, H. G. Knaggs, Ent. Ann. 1874, pp. 153 & 154. *A. plesaurina*, Butler & Druce, figured and re-described by A. G. Butler; Lep. Ex. p. 173, pl. lx. fig. 4.

Charaxes anticlea, Dru., ♀, and *druceanus*, Butl., re-described and figured by J. O. Westwood, Thes. ent. oxon. pp. 181 & 182, pl. xxxiv. figs. 5 & 6. *C. ephyra*, ♀, noticed by A. G. Butler, Ent. M. M. xi. p. 57.

Mynes guerini, Wall., is very variable, and probably = *geoffroyi*, Godt.; W. H. Miskin, Tr. E. Soc. 1874, pp. 237-240.

Paphia herbacea, Butler & Druce, figured and re-described by A. G. Butler, Lep. Ex. p. 173, pl. lx. fig. 3.

Smerina, g. n., W. C. Hewitson, Ann. N. H. (4) xiv. p. 359. Allied to *Atella*; type, *S. vindonissa*, sp. n., *l. c.*, Madagascar.

New species :—

Cynthia celebensis, A. G. Butler, Cist. Ent. i. p. 243, Menado.

Argynnis rhodope, p. 13 (Butt. N. Amer. ii. *Arg.* pl. vi.), British Columbia, *nitocris*, p. 15, Arizona, *nausicaa*, p. 104, Arizona, *opis*, p. 105, British Columbia, *elio*, p. 106, Montana, W. H. Edwards, Tr. Am. E. Soc. v.; *A. cashmirensis*, p. 267 (n. 25), pl. xliii. fig. 4, Soonamurg, Cashmere, *A. vitatha* and *sipora*, pl. lxvi. fig. 11, p. 568, F. Moore, P. Z. S. 1874.

Melitæa balbita, id. *l. c.* p. 268, pl. xliii. fig. 5, Soonamurg; *M. acastus*, W. H. Edwards, Tr. Am. E. Soc. v. p. 16, Montana, Nevada, Utah; *M. fasciata*, C. Hopffer, S. E. Z. xxxv. p. 349, Peru.

Phyciodes nana, H. Druce, Tr. E. Soc. 1874, p. 156, Peru; *P. (Eresia) adoza*, N. Erschoff, Ann. Ent. Russ. viii. pl. iii. fig. 5, Monterico, Peru.

Eresia prisca, Mexico and Peru, *acræa*, Peru, p. 349, *ericilla* and *calena*, Peru, *catula*, Bolivia, p. 350, *geminia*, Bolivia, Peru, p. 351, C. Hopffer, *l. c.*; *E. corybassa*, W. C. Hewitson, Bol. Butt. p. 6, Bolivia; *E. eutropia*, id. Ent. M. M. xi. p. 56, Panama; *E. cæla*, H. Druce, *op. cit.* p. 37, Costa Rica.

Synchlœa crocale, W. H. Edwards, *l. c.* p. 17, Arizona, Mexico.

Morpheis felderi, C. Hopffer, *l. c.* p. 351, Bolivia.

Symbrenthia hysudra and *asthala*, pp. 268 & 269, pl. xliii. figs. 8 & 9, Cashmere, *cotanda*, fig. 9, Darjeeling, and *kasiana*, Khasia Hills, p. 569, *daraka*, p. 570, fig. 10, N. India, pl. lxvi., F. Moore, *l. c.*

Grapta rusticus, California, Vancouver, *silvius*, California; W. H. Edwards, *l. c.* pp. 107 & 108.

Eunica amata, H. Druce, *Cist. Ent. i.* p. 285, Costa Rica.

Perisama vichada, Columbia, *canoma*, Peru, *id.* Tr. E. Soc. 1874, p. 156; *P. priene*, C. Hopffer, *l. c.* p. 351, Peru, Bolivia.

Catagramma cabirnia, p. 6, *cotyora* and *clisithera*, p. 7, W. C. Hewitson, *Bol. Butt.*, Bolivia.

Ectima rectifascia, Butler & Druce, *P. Z. S.* 1874, p. 345, Costa Rica.

Diadema pulchra, p. 281, fig. 2, New Caledonia, *montrouzieri* (δ = *lassinassa*, Montr., *nec* Cram.), p. 281, Navigator's Islands, *lutescens*, p. 283, fig. 3, Ovalau, Fiji, A. G. Butler, *P. Z. S.* 1874, pl. xlv.; *D. philippensis*, *id.* *Cist. Ent. i.* p. 243, Philippines; *D. monteironis*, H. Druce, *op. cit.* p. 286, W. Africa.

Panopea drucei, A. G. Butler, *Tr. E. Soc.* 1874, p. 426, pl. vi. fig. 3, Madagascar; *P. protracta*, *id.* *Ent. M. M. xi.* p. 164, Cabinda.

Pseudacraea trimeni (= *Panopea boisduvali*, var.; Trimen, *Tr. L. Soc.* xxvi. pl. xxvi. figs. 8 & 9), *id.* *l.* p. 57, Natal; *P. fulvaria*, p. 212, Ambrix, Cabinda, *striata* (φ ? = *Diadema euryta*, Hewitson, fig. 9), p. 213, Ambrix, *epigea* (? = *euryta*, var.), p. 214, W. Africa, *id.* *Cist. Ent. i.*

Hestina mimetica, *id.* *Tr. E. Soc.* 1874, p. 426, Java.

Minetra salentia (? = *M. sylvia* var.), C. Hopffer, *S. E. Z.* 1874, p. 35, Celebes.

Heterochroa leuceria, H. Druce, *l. c.* p. 286, Guatemala; *H. cognata*, W. C. Hewitson, *l. c.* p. 8, Bolivia.

Limenitis lepechini, N. Erschoff, *Lep. Turk.* p. 14, pl. i. fig. 10, Maracand; *L. hydaspes*, F. Moore, *l. c.* p. 270, pl. xliii. fig. 2, Cashmere.

Neptis nicomedes, p. 205, *nicoteles* and *nebrodes*, p. 206, W. C. Hewitson, *Ent. M. M. x.* Angola; *N. cnacalis*, *id.* *Ann. N. H.* (4) xiv. p. 357, Andaman Islands; *N. nolana*, H. Druce, *P. Z. S.* 1874, p. 105, Siam; *N. monata*, Weijenbergh, *Pet. Nouv. vi.* p. 408, Banka; *N. fervescens*, A. G. Butler, *l. c.* p. 427, Philippines; *N. kamarupa*, Assam, and *papaja*, Sumatra, p. 570, *harita*, E. Bengal, pl. lxvi. fig. 8, and *omeroda*, Penang, F. Moore, *l. c.*

Euryphene plistonax, figs. 38 & 39, Angola, *cinethon*, figs. 40 & 41, Gaboon; *Euryphene*, pl. ix., *Chilonis*; *Harma*, pl. vi., and *Eur.*, pl. x. figs. 42 & 43, Gaboon; W. C. Hewitson, *Ex. Butt.* v.

Rhomaleosoma wardi, H. Druce, *Cist. Ent. i.* p. 286, Cameroons.

Aterica clorana, *id.* *Tr. E. Soc.* 1874, p. 157, Angola [= *Iæra* 12-punctata, Snell., *teste* W. C. Hewitson in litt.].

Harma harmilla (*Harma*, pl. v., figs. 19 & 20) and *heliada* (figs. 21-23), *Ent. M. M. x.* p. 274, *coccinata*, figs. 24-26 (φ = *H. sangaris*, Hew., fig. 14; *H. usilda*, Hew., probably = *sangaris*, Godt., φ), *aniturgis*, text (= *aramis*, φ , fig. 27), *Harma*, pl. vi., and *Euryphene*, pl. x., W. C. Hewitson, *Ex. Butt.* v., all from W. Africa; *H. amenides*, *id.* *Ent. M. M. xi.* p. 56, Gaboon; *H. claudianus*, Cameroons, and *carsandra* [= *H. adelina*, *teste* Hewitson in litt.], Angola, H. Druce, *l. c.*

Adolias lupina, H. Druce, *id.* *l. c.* p. 158, Philippines; *A. acontius* and *cibaritis*, W. C. Hewitson, *Ann. N. H.* (4) xiv. pp. 357 & 358, Andaman Islands.

Tanaecia robertsi, A. G. Butler, Cist. Ent. i. p. 235, Malacca.

Apatura leilia, W. H. Edwards, Tr. Am. E. Soc. v. p. 103, Arizona.

Prepona dezamenus, C. Hopffer, l. c. p. 352, Peru.

Charaxes clitararchus, figs. 16 & 17, New Caledonia, *pithodorus*, figs. 18 & 19, Angola, W. C. Hewitson, Ex. Butt. v. *Char.* pl. iv.; *C. cedreatis*, id. Ent. M. M. x. p. 247, W. Africa; *C. imperialis*, A. G. Butler, Tr. E. Soc. 1874, p. 531, Whydah, Gold Coast; *C. lysianassa* (Hope, MS., ? = *boueti*, Feisth.), J. O. Westwood, Thes. ent. oxon. p. 181, pl. xxxiv. figs. 3 & 4, Ashanti.

Paphia beatrix, Chiriqui, *pedile*, Guatemala, p. 287, *ambrosia*, Veragua, Chiriqui, *polyxo*, Rio, p. 288, *mora*, New Granada, p. 289, H. Druce, Cist. Ent. i.; *P. hausewelli*, id. Tr. E. Soc. 1874, p. 158, Pebas; *P. sosippus*, p. 352, *falcata* and *phantes*, p. 353, Peru, *cluvia*, Bolivia, *betillina*, p. 354, and *praxias*, p. 355, Peru, C. Hopffer, l. c.; *P. cratais*, W. C. Hewitson, Bol. Butt. p. 9, Bolivia.

MORPHIDÆ.

Clerome menado, var.; C. Hopffer, S. E. Z. xxxv. p. 38.

Morpho leonte, Hübn. Habits; J. B. Capronnier & Van Volxem, Ann. Ent. Belg. xvii. pp. 28 & 29.

Morpho didius, p. 355, *papirius*, p. 356, Peru, *popilius*, p. 357, Bolivia, Venezuela, C. Hopffer, l. c.; *M. alexandrovna*, H. Druce, Tr. E. Soc. 1874, p. 155, Peru: spp. nn.

BRASSOLIDÆ.

Palæontina oolitica. A. G. Butler maintains that this fossil is Lepidopterous, in opposition to S. H. Scudder, who considers it to be a *Cicada*. Geol. Mag. (2) i. pp. 446-449, pl. xix.

Opsiphanes arsippe and *berecynthina*, C. Hopffer, S. E. Z. xxxv. p. 358, Peru; *O. luteipennis*, A. G. Butler, Tr. E. Soc. 1874, p. 425, locality unknown: spp. nn.

Caligo dentina, H. Druce, *op. cit.* p. 155, South Peru, sp. n.

Pavonia galba, E. Deyrolle, R. Z. (3) ii. pl. vii. hab. — ?.

Narope anartes, W. C. Hewitson, Bol. Butt. p. 9, Bolivia, sp. n.

SATYRIDÆ.

Lethe arete, Cram., is quite distinct from *L. europa*, Cram.; C. Hopffer, S. E. Z. xxxv. p. 38.

Euptychia zabdi, Butl., = *Pindis squamistriga*, Feld.; A. G. Butler, Lep. Ex., corrections.

Erebia haydeni, W. H. Edwards, re-described by him; Tr. Am. E. Soc. v. p. 19.

Argyrophenga antipodum, Doubl., figured by A. G. Butler; Lep. N. Zealand, pl. i. figs. 4-7.

Eneis jutta. Larva described; C. Berg, S. E. Z. xxxv. pp. 145 & 146. 1874. [VOL. XI.]

Æ. semidea, Say, figured in all stages; S. H. Scudder, Rep. Geol. N. Hampshire, i. pl. a, figs. 2, 4, 6, 9, 11, 13, & 14.

Chionobas gigas, Butl., ♀ figured by W. H. Edwards, Butt. N. Amer. ii. Chi. pl. i. figs. 5 & 6.

Pararge adrastra, and var. *maia*; A. Fuchs, S. E. Z. xxxv. pp. 78 & 79. *P. eversmanni*, F. d. W., described and re-figured by N. Erschoff, Lep. Turk. p. 19, pl. ii. fig. 15.

Satyrus (Pararge) egeria. Varieties; M. Girard, Bull. Soc. Ent. Fr. (5) iv. p. cclx. Var. *meone* taken near Grenoble; *id. l. c.* p. clxix.

Epinephele amardæa, Led. N. Erschoff figures and describes var. *nau-bidensis*, from Naubid, near Samarcand; *l. c.* p. 21, pl. v. fig. 73. *E. maiza*, Lang, figured and re-described; F. Moore, P. Z. S. 1874, p. 265, pl. xliii. fig. 6. *E. pulchella*, Feld., re-described; *id. l. c.* p. 566.

Satyrus hoffmanni, Streck., ♂ figured, and the species compared with *S. wheeleri*, W. H. Edwards, which Edwards thinks is the same. H. Strecker, Lepidoptera, pp. 66 & 67, pl. viii. fig. 12. *S. semele* alive for four days after losing its head; F. O. Standish, Ent. vii. p. 23.

Mycalasis v[i]ola, figs. 1 & 2, *ankova*, figs. 3 & 4, *iboina*, figs. 5 & 6, and *antahala*, figs. 7 & 8, figured by C. Ward, Afr. Lep. pl. xii. *M. megamede*, Hew., perhaps = *M. janardana*, Moore; C. Hopffer, *l. c.* p. 38. *M. ostrea*, Westw., = *otrea*, Cram., ♂; F. Moore, *l. c.* p. 567.

Acrophthalmia (?) diophthalma, Prittw., = *Xois sesara*, Hew.; A. G. Butler, P. Z. S. 1874, p. 279.

Cenonympha hero var. *areteoides*, from Anderghem, described by Fologne, CR. Ent. Belg. xvii. pp. xcvi. & xcix. fig.

Pedaliodes rapha and *japhleta* figured and re-described by A. G. Butler, Lep. Ex. p. 180, pl. lxii. figs. 4 & 5.

Oreoschistus euriphyle figured and re-described, *id. l. c.* p. 181, fig. 6.

Pronophila porcia, W. C. Hewitson, figured by him (as *P. paonides*); Ex. Butt. v. Pron. pl. v. fig. 57.

Taygetis kerea, Butl., = *Cyllopsis hedemanni*, Feld.; A. G. Butler, *l. c.* corrections.

Corades laminata and *fluminalis*, Butl., figured and re-described; *id. l. c.* pp. 181 & 182, pl. lxii. figs. 7 & 8.

Stibomorpha, g. n., A. G. Butler, Ent. M. M. x. p. 204. Allied to *Tetrablebia*; type, *S. decorata*, sp. n., *id. l. c.* p. 205, and Lep. Ex. p. 179, pl. 62, fig. 3, Santiago. Also *Satyrus monachus*, Blanch. (= *Pedaliodes lugubris*, Butl.), fig. 2, and *Sat. tristis*, Guér. (= *P. oares*, Butl.), fig. 1, figured; *id. Lep. Ex.* pl. lxii. *Satyrus tristis*, Blanch. (nec Guér.), is referred to this genus, and re-named *reedi*; *id. l. c.* p. 180.

New species :—

Hætera ceryce (? = *hyceta*, var.), W. C. Hewitson, Bol. Butt. p. 10, Bolivia.

Antirrhæa avernus, C. Hopffer, S. E. Z. xxxv. p. 359, Peru.

Tisiphone maculata, *id. l. c.* p. 360, Bolivia, Costa Rica, Mexico.

Euptychia peculiaris and *stelligera*, Minas Geraes, *angelica*, Rio, A.

G. Butler, Tr. E. Soc. 1874, p. 424 ; *E. disaffecta*, Butler & Druce, P. Z. S. 1874, p. 336, Costa Rica.

Neonympha melobosis and *abretia*, J. B. Capronnier, Ann. Ent. Belg. xvii. pp. 30 & 31, pl. i. figs. 5 & 6, Brazil.

Erebia maracandica, N. Erschoff, Lep. Turk. p. 17, pl. i. fig. 13, Maracand.

Callerebia daksha, F. Moore, P. Z. S. 1874, p. 266, pl. xliii. fig. 1, Goolmurg, Cashmere.

Chionobas iduna, W. H. Edwards, Butt. N. Amer. ii. *Chi.* pl. i. figs. 1-4, California.

Pararge cashmirensis, F. Moore, l. c. p. 265, pl. xliii. fig. 3, Goolmurg, Cashmere.

Epinephele interposita, N. Erschoff, l. c. p. 22, pl. ii. fig. 16, Maracand.

Satyrus phocus, W. H. Edwards, Tr. Am. E. Soc. v. p. 14, British Columbia ; *S. haufmanni*, N. Erschoff, l. c. p. 19, pl. i. fig. 14, Maracand ; *S. zapateri*, P. Oberthur, Pet. Nouv. vi. p. 452, Carthagenia (not described, and subsequently stated at p. 457 to = *S. priouri*, var., and to be new to Europe).

Hipparchia cadesia, F. Moore, l. c. p. 565, pl. lxvi. fig. 7, Cashmere.

Mycalesis pandea, C. Hopffer, l. c. p. 39, Celebes ; *M. khasiana*, Khasia Hills, and *charaka*, N. E. Bengal, F. Moore, l. c. p. 566.

Ypthima megalomma, A. G. Butler, Cist. Ent. i. p. 236, Shanghai ; *Y. newara* (= *nareda*, Hew., Tr. E. Soc., 3, ii. pl. xvii. fig. 7, *nec* 6), Nepal, *nikæa*, N. W. Himalayas, and *avanta*, Cashmere, p. 567, *ariaspa*, p. 568, Punjab, F. Moore, l. c.

Cenonympha nolckenii, N. Erschoff, l. c. p. 23, pl. ii. fig. 17, Naubid ; *C. fettigi*, C. Oberthur, l. c. p. 412, Oran.

Lymanopoda larunda, Peru, Venezuela, *venusia*, Peru, p. 361, *apulia*, Bolivia, p. 362, C. Hopffer, l. c. ; *L. insulsa*, W. C. Hewitson, Bol. Butt. p. 12, Bolivia.

Girochilus tritonia, W. H. Edwards, l. c. p. 18, Arizona.

Oxeoschistus submaculatus, Butler & Druce, P. Z. S. 1874, p. 338, Costa Rica.

Pronophila pasicrates, figs. 51 & 59, locality unknown, *phrasicla*, *pali-zethes*, and *paonides* (*porcia* on plate, in error), figs. 52-54, Ecuador, *pharnaspes*, fig. 55, Venezuela, *pallantis*, fig. 56, and *phthiotis*, fig. 58, Ecuador (*Pron.* pl. viii.), *P. panthides*, fig. 60, *pandates*, figs. 61 & 62, *perisades*, fig. 63, *pammenes*, figs. 64 & 66, *pactyes*, fig. 65 (*Pron.* pl. ix.), all from Bolivia, W. C. Hewitson, Ex. Butt. v. ; *P. examina*, N. Erschoff, Ann. Ent. Russ. viii. pl. iii. fig. 7, Punamarca, Peru ; *P. chryso-tenia*, C. Hopffer, l. c. p. 361, Peru.

Taygetis sosis, C. Hopffer, l. c. p. 359, Peru, Surinam, Bahia.

Corades tricordatus and *callipolis*, W. C. Hewitson, Bol. Butt. pp. 10 & 11, Bolivia.

LIBYTHEIDÆ.

Libythea bachmani, Kirtl., figured and re-described in all stages by W. H. Edwards, Butt. N. Amer. ii. *Lib.* pl. i.

EURYTELIDÆ.

Melanitis cottenis, W. C. Hewitson, Ann. N. H. (4) xiv. p. 358, Andaman Islands, sp. n.

Elymnias singhala, F. Moore, P. Z. S. 1874, p. 568, Ceylon, sp. n.

Dyctis astrifera, A. G. Butler, Tr. E. Soc. 1874, p. 425, Batchian, sp. n.

ERYCINIDÆ.

J. B. Capronnier, Ann. Ent. Belg. xvii., quotes the following unpublished genera of Boisduval: *Talites* (types *meris* and *thersander*, Cram.), *Fritilla* (type *meleagris*, Boisduval), p. 20, *Andara* (type, *helius*, Cram.), p. 21.

Mesene xypete, W. C. Hewitson, figured and re-described; Ex. Butt. v. *Erycinidæ*, figs. 8 & 9.

Hermathena, g. n., W. C. Hewitson, Bol. Butt. p. 15. Allied to *Pandemos*; type, *H. candidata*, sp. n., l. c. p. 16, Bolivia.

Xynias, g. n., id. l. c. p. 17. Allied to *Ithomiola*, type, *X. cynosema*, sp. n., l. c. p. 18, Bolivia.

New species:—

Zemeros albipunctata, A. G. Butler, Cist. Ent. i. p. 236, Malacca.

Abisara rutherfordi, W. C. Hewitson, Ent. M. M. xi. p. 56, W. Africa (Cross River).

Mesosemia atroculis, Pebas, Ecuador, *trilineata*, Amazons, p. 429, *latizonata*, Sarayaco, Ecuador, *judicialis*, Ucayali, Peruvian Amazons, *hesperus*, Chontales, p. 430, A. G. Butler, Tr. E. Soc. 1874; *M. grandis*, H. Druce, op. cit. p. 159, Chiriqui; *M. ceropia*, id. Ent. M. M. xi. p. 37, Costa Rica.

Cremna meleagris, C. Hopffer, S. E. Z. xxxv. p. 362, Peru.

Eurygonu chirone and *corduena*, W. C. Hewitson, Bol. Butt. p. 13, Bolivia; *E. fervida*, A. G. Butler, l. c. p. 431, Maracaibo.

Panara aureizona, Minas Geraes, *artifasciata*, Espirito Santo, id. l. c. p. 432.

Limnys cercopes, p. 18, *agates* and *ambryllis*, p. 19; W. C. Hewitson, l. c. Bolivia.

Erycina mina and *miranda*, id. l. c. pp. 12 & 13, Bolivia.

Necyria whitelyiana, Peru, and *butleria*, New Granada, H. Druce, l. c. p. 159; *N. westwoodi*, C. Hopffer, l. c. p. 362, Peru.

Rusalkia charon, A. G. Butler, l. c. p. 432, Rio.

Siseme luculenta, N. Erschoff, Ann. Ent. Russ. viii. pl. iii. fig. 4, Peru; *S. lucilus*, C. Hopffer, l. c. p. 383, Peru, Bolivia.

Helicopsis lindeni, A. R. Grote, Bull. Buff. Soc. ii. p. 108, pl. ii. Amazon region.

Anteros medusa, H. Druce, l. c. p. 160, Panama; *A. principalis*, C. Hopffer, l. c. p. 383, Peru.

Emesis heterochroa, id. l. c. p. 364, Peru, Bolivia.

Symmachia psittacus, id. l. c. p. 364, Peru; *S. chrysame*, W. C. Hewitson, l. c. p. 16, Bolivia.

Mesene pyrippe, figs. 3 & 4, *philonis*, fig. 5, *capissene*, figs. 6 & 7, W. C. Hewitson, Ex. Butt. v. *Erycinidæ*, Espirito Santo, Brazil.

Charis fasciata, C. Hopffer, l. c. p. 364, locality unknown.

Bæotis felix and *creusis*, W. C. Hewitson, Bol. Butt. p. 17, Bolivia; *B. bacenis* and *barzunes*, id. Ex. Butt. v. *Erycinidæ*, figs. 1 & 2, Ecuador; *B. elegantula*, C. Hopffer, l. c. p. 365, Peru.

Lasaia militaris, id. l. c. Peru.

Lemonias lyncestes, figs. 50 & 51, Cayenne, *charis*, figs. 52 & 53, Brazil, W. C. Hewitson, l. c. *Erycinidæ*; *L. curulis* and *antanitis*, id. Bol. Butt. pp. 14 & 15, Bolivia.

Nymphidium anthias, *cænetus*, and *cyneas*, id. l. c. p. 14, Bolivia.

LYCENIDÆ.

Pseudodipsas, *Poritia*, and *Lycænesthes*. W. C. Hewitson discusses the distinctive characters of these genera, all of which he admits. Tr. E. Soc. 1874, p. 343.

Dipsas attilia, Brem., ♀ described; R. P. Murray, Ent. M. M. xi. p. 168.

Thecla. W. C. Hewitson has published part vi. of his "Illustrations of Diurnal Lepidoptera" (London: Dec. 1874, pp. 151-185, pls. 60-73). It is entirely devoted to *Thecla*, and the following known species are re-described and figured:—*T. arola*, p. 151, figs. 392 & 393, *oreala*, p. 152, figs. 399-403, pl. lx.; *ziba* (of which *thulia* is a synonym), p. 153, figs. 404 & 405, *lucena*, p. 154, figs. 406 & 407; *echion*, Linn. (*crolus*, Cr., = ♂), figs. 410 & 411; *basalides*, Hübn. (*Tmolus sophocles*, Butl., = ♀), figs. 412-415, p. 155, pl. lxi.; *cælebs*, H. S., figs. 416 & 417, *martialis*, H. S., figs. 418 & 419, p. 156, *yojoa*, Reak., p. 158 (*daraba*, figs. 424-426, and *beræa*, Hew., are =), *mulucha*, Hew. (*invisa*, Butl., is =), fig. 428, pl. lxii., *sophocles*, Fabr., p. 159 (*Bithys sphinx*, Hübn., is =), *salona*, p. 159, figs. 429 & 430, *limenia*, p. 160, figs. 431 & 432, *faunalia*, p. 161, figs. 437 & 438, pl. lxiii., *trebonia*, p. 162, figs. 443 & 444, *calesia*, p. 163, figs. 445 & 446, *timoclea*, figs. 449 & 450, *carteia*, figs. 451 & 452, p. 164, pl. lxiv., *cordelia*, figs. 453 & 454, *thespia*, figs. 455 & 456, p. 165, *bosora*, p. 166, figs. 459 & 460, pl. lxv., *epopea*, p. 168, figs. 472-474, *cleocha*, p. 169, figs. 475 & 476, pl. lxvi., *calicolor*, Butl. (= *T. hena*, Hew., figs. 486 & 487), *ergina* (= *ela*, figs. 488 & 489), p. 171, pl. lxvii., *theia*, p. 172 (= *æthesa*, figs. 493 & 494), *elongata*, p. 173, figs. 495 & 496, *atymna*, figs. 499-501, *gabatha*, figs. 504 & 505, p. 174, pl. lxviii., *halala*, p. 175, figs. 508 & 509, *gaina*, p. 176, figs. 513 & 514, pl. lxix., *cleon*, var. *ecbatana*, p. 178, pl. lxx., figs. 525 & 526, *carpophora*, fig. 547, *erema*, figs. 550 & 551, *aphaca*, fig. 552, *syncellus*, figs. 553 & 554, *punctum*, figs. 555 & 556, *inachus*, Cram. (= *bæton*, Sepp), figs. 557-559, p. 182, pl. lxxii., *centoripa*, figs. 562 & 563, *aunus*, figs. 567 & 568, p. 183, *badaca*, p. 184, figs. 569 & 570, pl. lxxiii.

Thecla quercus, var. with orange spot on fore wings; F. Norgate, Ent. vii. p. 69. *T. rubi*, var. from St. Leonard's Forest; W. C. Boyd, P. E. Soc. 1874, p. xix.

Chrysophanus rubidus, figs. 1-3, *cupreus*, figs. 4-7, and *sirius*, figs. 8-10, figured by W. H. Edwards, Butt. N. Amer. Chr. pl. i. *C. salustius*, Fabr.,

figs. 1-3, and *boldenarum*, White, figs. 8 & 9, figured, pl. i., and the latter re-described, p. 3; A. G. Butler, Lep. N. Zealand.

Polyommatus alciphron. A var. from the Apennines described and compared with the type and var. *gordius*. The variety and *alciphron* ♀ figured for comparison. P. Stefanelli, Bull. Ent. Ital. vi. pp. 83-85, pl. i. figs. 1 & 2.

Cupido. J. Spångberg has published a monograph of the Scandinavian species (Om de Svenska och Norska arterna af Dagfjärilsläktet *Cupido*, Schrank (Upsala: 1872, 8vo, pp. 63). The following species are included, which are described at length in Swedish, from a comparison of long series of specimens:—*C. dorylas*, *chiron*, *alexis*, *icarus*, *thetis*, *icarius*, *argus*, *argyrognomon*, *battus*, *optilete*, *arion*, *alcon*, *argiolus*, *semiargus*, *alsus*, *cyllarus*, *atys*, and *meleager*.

Lycena. H. Strecker (Lepidoptera, pp. 81-94, pl. x.) monographs the North American species, including both "Blues" and "Coppers" in the genus, and even suggesting that the "Hair-streaks" should also be included. He re-describes many known species, and figures *L. tejua*, Reak., fig. 3; *monica*, Reak., fig. 18; *pembina*, Edw., figs. 10 & 11; *catalina*, Reak., figs. 1 & 2; *orbitulus*, De Prunn, fig. 16; *rapahoe*, Reak., figs. 14 & 15; *anna*, Edw., figs. 4 & 5; *melissa*, Edw., figs. 8 & 9; *gorgon*, Boisd., fig. 17; *hellouides*, Boisd., figs. 19 & 20; *ianthe*, Edw. figs. 23 & 24; *mariposa*, Reak., figs. 25 & 26; *arota*, Boisd., figs. 27 & 28; *virginiensis*, Edw., figs. 21 & 22; *xanthoides*, Boisd., figs. 12 & 13; *sirius*, Edw., figs. 29 & 30, and *heteronea*, Boisd., figs. 6 & 7.

Lycena. R. P. Murray does not consider the characters of the sections to be of generic value; Tr. E. Soc. 1874, pp. 527-529. *L. violacea*, *lygdamus*, *pseudargiolus*, *neglecta*, and *lucia*, are hardly distinct; P. C. Zeller, S. E. Z. xxxv. p. 443. *L. adonis*: natural history; J. Hellins, Ent. M. M. xi. pp. 113-116. *L. argia*, Mén.; R. P. Murray, *op. cit.* p. 167. *L. argus*: N. Erschoff describes var. *maracandica*; Lep. Turk. p. 10. *L. cassius*: H. K. Morrison describes var. *floridensis*; Bull. Buff. Soc. i. p. 187. *L. fortunata*, Staud., = *L. webbianus*, Brullé; C. Hopffer, S. E. Z. xxxv. p. 48. *L. icarus*: hermaphrodite recorded by Lelièvre, Pet. Nouv. vi. p. 409. *L. ladonides*, De l'Orza, is hardly distinct from *argiolus*; R. P. Murray, *l. c.* p. 168. *L. lucifera*, Staud., is distinct from *L. subsolanus*, Eversm.; O. Staudinger, S. E. Z. xxxv. pp. 87 & 88. *L. lysimon* occurs in the Canaries; C. Hopffer, *l. c.* p. 48. *L. macrophthalmia*, Feld.: *Acrophthalmia* (?) *argentina*, Prittw., is or allied to this; A. G. Butler, P. Z. S. 1874, p. 285 [cf. S. E. Z. 1867, p. 274]. *L. marina*, Reak., = *cassius*, Cram.; Butler & Druce, R. Z. S. 1874, p. 354. *L. phæbe*, Murray, is very near *L. erinus*, Herr.-Schäff., but quite distinct from *L. erinus*, Fabr.; W. F. Kirby, P. E. Soc. 1874, p. ii. *L. pseudargiolus*: transformations described; W. H. Edwards, Canad. Ent. v. pp. 223 & 224. *L. scudleri*, Edw., re-described in full by H. B. Möschler, S. E. Z. xxxv. pp. 155 & 156.

Glaucopsyche. S. H. Scudder admits only two species, *lygdamus*, Doubl. (probably = *antiacis*, Boisd.), and *couperi*, Grote (probably = *pembina*, auctt., but not the true *pembina*, Edw., which has been lost sight of, and not yet identified); Bull. Buff. Soc. i. pp. 197 & 198.

Pseuderesia, g. n., A. G. Butler, Tr. E. Soc. 1874, p. 532. Allied to *Liptena*; type, *P. catharina*, sp. n., l. c. pl. xi. figs. 4 & 5, Whydah, Gold Coast.

Niphanda, g. n., F. Moore, P. Z. S. 1874, p. 572. Allied to *Chrysophanus*; type, *N. tessellata*, sp. n., l. c. pl. lxvi. fig. 6, Penang.

Satsuma, g. n., R. P. Murray, Ent. M. M. xi. p. 168. Type, *Lycæna ferrea*, Butl. (? = *Thecla cerulescens*, Motsch.).

New species: —

Epitola belli, W. C. Hewitson, Ann. N. H. (4) xiii. p. 382, Coomassie
Liphyra leucyania, id. Tr. E. Soc. 1874, p. 355, Old Calabar.

Deudorix deritas, Angola, and *deliochus*, India, id. l. c. p. 352; *D. selira*, F. Moore, P. Z. S. 1874, p. 272, Cashmere (= *D. nissa*, Hew. fig. 44); *D. simsoni*, W. H. Miskin, Ent. M. M. xi. p. 165, Queensland.

Myrina binaculata, Gaboon, and *nomenia*, Old Calabar, W. C. Hewitson, l. c. p. 353.

Iolais mimosæ, R. Trimen, Tr. E. Soc. 1874, p. 330, pl. ii. figs. 1 & 2, S. Africa.

Pseudodipsas cephenes, India, and *digglesi*, Queensland, W. C. Hewitson, l. c. p. 344; *P. innotatus*, W. H. Miskin, l. c. p. 165, Queensland.

Poritia phalena, p. 344, Singapore, *phalia* and *pharyge*, p. 345, Borneo, *pheretia*, Singapore, *philotæ*, Sumatra, *pleurata*, Singapore, p. 346, *promula*, Java, and *patina*, Singapore, p. 347; W. C. Hewitson, l. c.

Lycenesthes lusones, Gaboon, p. 347, *leptines*, Congo, *lysicles*, Old Calabar, *lacides*, Angola, p. 348, *lucretilis* and *liodes*, Gaboon, *ligures*, Angola, p. 349, and *licates*, Macassar, p. 350, W. C. Hewitson, l. c.; *L. lyzanus*, id. Ent. M. M. xi. p. 36, Old Calabar.

Hypolycæna buxtoni, W. C. Hewitson, op. cit. x. p. 206; *H. seamani*, R. Trimen, l. c. p. 332, pl. ii. figs. 3 & 4: both from S. Africa.

Aphnæus namaquus, id. l. c. p. 334, pl. ii. figs. 5 & 6, Namaqua Land.

Cigaritis amine, A. G. Butler, op. cit. p. 533, pl. xi. figs. 1 & 2, Whydah, Gold Coast.

Dipsas icana, F. Moore, l. c. p. 575, pl. lxvii. fig. 3, N.W. Himalayas.

Thecla. W. C. Hewitson (Ill. D. L. vi.) describes and figures *T. cardus*, p. 151, figs. 394–396, and *sendiga*, p. 152, figs. 397 & 398, both from Brazil, pl. lx.; *azuba*, p. 154, pl. lxi. figs. 408 & 409, Rio Grande; *crethona*, figs. 420 & 421, Jamaica, *coronta*, figs. 422 & 423, Cayenne, p. 157, *crossæa*, p. 158, fig. 427, locality unknown, pl. lxii.; *cydia*, p. 160, figs. 433 & 434, Rio Janeiro, *cybira*, p. 161, figs. 435 & 436, *angelia*, figs. 439 & 440, both from Cuba and Jamaica, *argona*, figs. 441 & 442, Uruguay, p. 162, pl. lxiii.; *appula*, p. 163, pl. lxiv. figs. 447 & 448, Bolivia, Venezuela; *cepea*, p. 165, figs. 457 & 458, Ecuador, *anthracia*, p. 166, figs. 461–463, Brazil, *aunia*, figs. 464 & 465, Venezuela, pl. lxv.; *pactya*, figs. 466 & 467, Ecuador, Bogota, *fidelia*, figs. 468 & 469, p. 167, *endela*, p. 168, figs. 470 & 471, both from Venezuela, *peona*, p. 169, figs. 477–479, locality unknown, *parasias*, figs. 480 & 481, Nicaragua, *elana*, figs. 482 & 483, Espirito Santo, Brazil, *selika*, figs. 484 & 485, Brazil, p. 170, *thoana*, fig. 490, *arindela*, figs. 491 & 492, both from Nicaragua, p. 172, pl. lxvii.; *clarina*, p. 173, figs. 497 & 498, Mexico,

parthenia, p. 174, figs. 502 & 503, Nicaragua, pl. lxviii.; *corolena*, p. 175, figs. 506 & 507, Cayenne, *syncena*, figs. 510–512, Brazil, *taréna*, figs. 515 & 516, Cayenne, p. 176, *volupia*, figs. 517 & 518, Nicaragua, *lemona*, figs. 519 & 520, p. 177, pl. lxix.; *casmilla*, figs. 521 & 522, Brazil, *arja*, figs. 523 & 524, Nicaragua, p. 178, *doryasa*, figs. 527 & 528, Para, *celona*, figs. 529 & 530, Espirito Santo, *dicæa*, figs. 531 & 532, locality unknown, p. 179, *demea*, figs. 533 & 534, Nicaragua, pl. lxx.; *deniva*, figs. 535 & 536, Brazil, *legytha*, figs. 537 & 538, Nicaragua, p. 180, *lorina*, figs. 539 & 540, locality unknown, *ligurina*, figs. 541 & 542, Nicaragua, *celelata*, figs. 543 & 544, and *catrea*, figs. 545 & 546, Brazil, p. 181, pl. lxxi.; *orcidia*, p. 183, figs. 560 & 561, Amazon, *orsilla*, figs. 564–566, Ecuador, *myrsina*, figs. 571 & 572, Nicaragua, p. 184, pl. lxxiii.

Thecla sedecia (= *polibetes*, var. *sedecia*, Ill. D. L. vi. p. 182, pl. lxxii. figs. 548 & 549) and *chonida*, Mexico, *cyrriana*, Peru, *critola*, p. 105, and *mathewi*, Mexico, *cyphara*, Panama, *quadrimaculata*, locality unknown, p. 106, Hewitson, Ent. M. M. xi.; *T. circinata* & *crambus*, id. Bol. Butt. pp. 19 & 20, Bolivia; *T. mirabilis* and *lunulata*, N. Erschoff, Lep. Turk. p. 7, pl. i. figs. 4 & 5, Sarafschan; *T. siva*, W. H. Edwards, Tr. Am. Ent. Soc. v. p. 110, Arizona; *T. lenis*, Itaipu, and *deborrei*, Botafogo, J. B. Capronnier. Ann. Soc. Ent. Belg. xvii. pp. 16 & 17, pl. i. figs. 3 & 4.

Hypochrysops dicomus, Waigiou, *halyætus*, Australia, p. 350, *hypates*, Kaiou, *hippuris*, p. 351, and *herdonius*, p. 352, Aru; W. C. Hewitson, Tr. E. Soc. 1874.

Lycaena chinensis, p. 523, fig. 5, N. China, *pulchra*, figs. 7 & 8, W. Africa, and *lineata*, Queensland, fig. 9, p. 524, *indica*, p. 525, figs. 2 & 3, Allahabad, *parva* (? = *trochilus* var.), p. 526, fig. 1, Diamond Fields, S. Africa, *felderi*, p. 527, figs. 4 & 6, Queensland, R. P. Murray, Tr. E. Soc. 1874, pl. x.; *L. japonica*, id. Ent. M. M. xi. p. 167, Japan; *L. lynnessa*, W. C. Hewitson, op. cit. p. 107, Chili; *L. tengstræmi* and *prosecusa*, N. Erschoff, l. c. pp. 11 & 13, pl. i. figs. 8 & 9, Turkestan; *L. rhode* and *philo*, C. Hopffer, S. E. Z. xxxv. p. 37, Celebes; *L. ardates*, F. Moore, l. c. p. 574, pl. lxxvii. fig. 1, Cochinchina; *L. christophi*, Turkestan, and *mirza*, Persia, O. Staudinger, S. E. Z. xxxv. pp. 87 & 90; *L. allardi*, C. Oberthur, Pet. Nouv. vi. p. 412, Algeria; *L. pseudofea*, H. K. Morrison, Bull. Buff. Soc. i. p. 186, Florida.

Agriades minnehaha, S. H. Scudder, P. Bost. Soc. xvii. p. 88, Heart River Crossing.

Cupido agnata, H. Druce, P. Z. S. 1874, p. 106, pl. xvi., figs. 2–4, Siam.

Glaucopsyche couperi, A. R. Grote, Bull. Buff. Soc. i. p. 185, Anticosti. *Scolitantides cashmirensis*, F. Moore, l. c. p. 272, Soonamurg, Cashmere.

Thestor fedtschenkoi, N. Erschoff, l. c. p. 8, pl. i. fig. 6, Maracand and Sarafschan.

Chrysophanus zariaspa, p. 271, Soonamurg, Cashmere, and *aditya*, p. 571, pl. lxvi. fig. 1, Ladak, F. Moore, l. c.

Polyommatus solskyi, N. Erschoff, l. c. p. 8, pl. i. fig. 7, Maracand; *P. teysmanni*, Weyenbergh, Pet. Nouv. vi. p. 408, Banca; *P. vardhana*, p. 572, fig. 5, Busahir, *omphisa*, fig. 2, and *devanica*, fig. 4, Ladak,

jaloka, fig. 3, p. 573, pl. lxvi., *samudra*, p. 574, pl. lxvii. fig. 2, Baltistan, F. Moore, l. c.

Zeritis lycegenes, p. 337, fig. 7, Natal, *barklyi*, p. 338, figs. 8 & 9, Namaqua-land, *orthrus*, p. 340, fig. 10, Natal, R. Trimen, l. c. pl. ii.; *Z. zaraces* and *zorites*, W. C. Hewitson, *op. cit.* p. 354, S. Africa.

Miletus irroratus, H. Druce, P. Z. S. 1874, p. 106, Siam.

Liptena adelgitha, W. C. Hewitson, Ent. M. M. xi. p. 36, Gaboon.

Pintila picena and *petreia*, p. 382, *phidia* (? = *abraxas* var.), p. 383; *id.* Ann. N. H. (4) xiii. Coomassie.

HESPERIDÆ.

S. H. Scudder (Bull. Buff. Soc. i. pp. 195 & 196) divides the *Urbicolæ* into two groups, to which he applies the names *Hesperides* and *Astyci*, and gives detailed comparative characters. To the *Hesperides* he refers *Pyrrhopyga*, *Erycides*, *Thymele*, *Thorybes*, *Achylodes*, *Erynnis*, *Hesperia*, &c.; to the *Astyci*, *Ancyloxypha*, *Thymelicus*, *Cyclopides*, *Atrytone*, *Pamphila*, *Augiades*, *Limochares*, *Prenes*, *Calpodus*, *Lerema*, &c.

W. C. Hewitson (Ex. Butt. v.) figures and re-describes his *Cyclopides carmides*, fig. 1, *capenas*, figs. 2 & 3, *caicus*, figs. 4 & 5, *cariate*, fig. 8, *cænides*, fig. 9, *callicles*, figs. 10 & 11, *cheles*, figs. 12 & 13 (*Cyclopides*, pl. i.), *argenteo-ornatus*, figs. 18 & 19, *Hesperilla dirphia* (distinct from *doubledayi*), figs. 1-3, *halyzia*, figs. 4-6, and *donnysa*, fig. 7 (*Cyclopides* and *Hesperilla*), *Chatocneme callixenus*, fig. 1, *Netrocoryne beata*, figs. 2 & 3, and *denitza*, fig. 4, *Cæsina calathana* and *compusa*, figs. 5 and 6 (*Hesperidæ*).

A. G. Butler (Lep. Ex.) figures and re-describes his *Carystus ladana*, *jabesa*, *ozota*, *obeda*, and *canente*, *Erycides yokhara*, *Proteides xarippe*, *Leucochitonea paradisea*, *Hesperia vitta*, *hurama*, and *inara*, *Plastingia hieroglyphica*, pp. 166-171, pl. lix. figs. 1-12; *Carystus jeconia* and *gemmatus*, *Plastingia helena*, *Erycides vida*, *Arteurotia tractipennis*, *Pithonides gladius* and *jabesa*, *Cyclopides argenteogutta*, *Pamphila lotana*, *Phlebodes koza*, *itona*, and *unia*, pp. 186-190, pl. lxiv.

Pyrrhopyge. C. Hopffer (S. E. Z. xxxv. pp. 370 & 371) briefly characterizes *zeleucus*, Swains. (? Fabr.), *jonas*, Feld., and *charybdis*, Westw., to compare with some new species. *P. zimra*, Hew., = *jamina*, Butl.; A. G. Butler, l. c. p. 167.

Goniloba corope, H. S., from Brazil, is distinct from *Carystus corope*, H. S. It is re-named *Carystus orope*, Plötz, Ann. Ent. Belg. xvii. p. 34.

Pamphila. S. H. Scudder (Mem. Bost. Soc. ii. pt. iii. No. 4, pp. 341-353) restricts this genus to *P. comma* and allies. He describes and figures (pl. x.) 8 species (inclusive of *P. comma*, L., which does not occur in America), with the abdominal appendages of the males (pl. xi.). The known species are *P. sassacus*, Harr., p. 346, pl. x. figs. 5 & 6, pl. xi. figs. 9, 12 & 14; *othoe*, Edw., p. 348, pl. x. fig. 6, pl. xi. figs. 13 & 16; *juba*, Scudd. (= *comma*, Boisd., from California), p. 349, pl. x. figs. 19 & 20, pl. xi. figs. 5 & 6; *comma*, L., p. 350, pl. x. figs. 12-15, pl. xi. figs. 10 & 11; and *sylvanoides*, Boisd. (= *columbia*, Scudd.), p. 351, pl. x. figs. 20 & 21, pl. xi. figs. 15 & 17.

Pamphila sylvanus. The males appear ten or fourteen days before the females; A. O. Ward, Ent. M. M. x. p. 230.

Lerema. On the ocelli; S. H. Scudder, P. Bost. Soc. xvi. pp. 165 & 166 (cf. Zool. Rec. x. p. 387).

Amblyscirtes vialis. A new species apparently allied to this from Heart River Crossing noticed; *id.* l. c. p. 91.

Hesperia kiowah, Reak., = *metacomet*, Harr., *H. powesheik*, Park., = *garita*, Reak.; H. Strecker, Lepidoptera, p. 93.

Pyrgus montivagus, Reak., = *syrictus*, Fabr.; Butler & Druce, P. Z. S. 1874, p. 369.

Syrictus alveus, Hübn., var. *alpina*, from Khokand, described and figured; N. Erschoff, Lep. Turk. p. 24, pl. ii. fig. 18.

Ancistroides, g. n., A. G. Butler, Tr. E. Soc. 1874, p. 436. Allied to *Carystus* and *Astictopterus*; type, *A. longicornis*, sp. n., *ibid.*, Timor.

New species :—

Eudamus barisses, W. C. Hewitson, Bol. Butt. p. 22, Bolivia; *E. philistus*, C. Hopffer, S. E. Z. xxxv. p. 367, Peru.

Goniloba pletzi, J. B. Capronnier, Ann. Ent. Belg. xvii. p. 33, pl. i. fig. 7, Therezopolis.

Ismene excellens, C. Hopffer, l. c. p. 39, Celebes; *I. mahintha*, F. Moore, P. Z. S., 1874, p. 575, pl. lxvii. fig. 4, Burmah.

Oxynetra felderi, C. Hopffer, l. c. p. 367, Peru (= *O. semihyalina* ♀, Feld.).

Hesperia (Oxynetra) zambesiaca, Zambesi, and *namaquana*, S. Africa; J. O. Westwood, Thes. ent. oxon. p. 183, pl. xxxiv. figs. 9 & 10.

Pyrrhopyge phœaz, p. 368, and *sergius* (= *P. leucoloma*, N. Erschoff, Ann. Ent. Russ. viii. pl. iii. fig. 2), Peru, *papias*, New Granada, Bolivia, *sejanus*, locality unknown, p. 369, *proculus*, (= *zeleucus*, Erichs.), Guiana, *lamprus* and *roscius*, p. 370, and *polemon*, p. 371, Brazil, C. Hopffer, l. c.; *P. creon*, Calobre, Veragua, *cydonia*, Oaxaca, Mexico, p. 289, and *creona*, Peru, p. 290, H. Druce, Cist. Ent. i.; *P. cosinga* and *phylleia*, W. C. Hewitson, Bol. Butt. pp. 20 & 21, Bolivia.

Ericides charonitis, *id.* l. c. p. 21, Bolivia.

Carystus placeus, A. G. Butler, Tr. E. Soc. 1874, p. 435, Bogota; *C. theugenis*, Botafogo, and *lucia*, Therezopolis, J. B. Capronnier, l. c. pp. 34 & 35, pl. i. figs. 8 & 9.

Hesperia pavnee, G. M. Dodge, Canad. Ent. vi. p. 44, Nebraska; *H. acalle*, C. Hopffer, l. c. p. 41, Celebes; *H. karsana*, F. Moore, l. c. p. 576, pl. lxvii. fig. 6, Punjab.

Pamphila nevada, p. 347, pl. x. figs. 1–4, pl. xi. figs. 3, 4 & 4a, Western North America, *colorado*, p. 349, pl. x. figs. 16–18, pl. xi. figs. 1 & 2, Colorado, Arizona, *manitoba*, p. 351, pl. x. figs. 8–11, pl. xi. figs. 7 & 8, Colorado and Lake Winnipeg, S. H. Scudder, Mem. Bost. Soc. ii.; *P. dimila*, F. Moore, l. c. p. 576, Busahir.

Pyrgus cashmirensis, p. 274, pl. xliii. fig. 7, and *dravira*, p. 576, pl. lxvii. fig. 5, both from Cashmere; F. Moore, l. c.

Syrictus bocchoris, W. C. Hewitson, l. c. p. 22, Bolivia.

Cyclopides croites, fig. 14, Australia, *crithote*, figs. 15 & 16, Ecuador,

cynone, fig. 17, Australia, (*Cyclopides* and *Hesperilla*), *C. ceracrates*, Mexico, (*Cyclopides*), figs. 6 & 7; *id.* Ex. Butt. v.

Heteropterus (*Cyclopides*) *jelskyi*, N. Erschoff, *l. c.* pl. iii. fig. 6, Tarina, Peru.

Carterocephalus planeus, C. Hopffer, *l. c.* p. 367, Peru.

Pterygospidea trebellius, *id.*, *l. c.*, p. 41, Celebes.

Taractrocera lineata, H. Druce, P. Z. S. 1874, p. 109, pl. xvi. fig. 7, Siam.

Pythonides hierax, C. Hopffer, *l. c.* p. 366, Peru.

Achlyodes termon, p. 365, Peru, and *trochilus*, p. 366, Bolivia, *id.* *l. c.*

Antigonus decens, A. G. Butler, *l. c.* p. 436, Peruvian Amazons; *A. mutillatus*, C. Hopffer, *l. c.* p. 366, Peru; *A. janthinus*, J. B. Capronnier, *l. c.* p. 38, pl. i. fig. 10, Botafogo.

SPHINGIDÆ.

Hybrids occurring naturally between *Deilephila vespertilio* and *hippophæus*; *D. vespertilio* and *D. euphorbie*; *D. elpenor* and *D. porcellus*, and *Smerinthus ocellatus* and *S. populi* noticed; Frey & Wullschlegel, MT. schw. ent. Ges. iv. pp. 206-210.

List of 15 *Sphingidæ* collected by C. Linden in Brazil; A. R. Grote, Bull. Buff. Soc. i. pp. 279-281.

Sesia uniformis, G. & R., is distinct from *thysbe*, Kirby; *id.* Canad. Ent. vi. pp. 170 & 171.

Macroglossa venata, Felder, figured by him under the new generic name of *Æge*; Reise Novara, Lep. iv. pl. lxxv. fig. 6.

Hemaris; cf. Grote & Lintner, Canad. Ent. vi. pp. 145-147.

Hemeroplanes oiclus, Cram., is quite distinct from *H. pseudothyreus*, Grote; A. R. Grote, Bull. Buff. Soc. i. p. 279.

Perigona caliginosa, Boisd., figured by Felder under the new generic name of *Pachygonia*; *l. c.* pl. lxxv. fig. 10.

Ambulyx rostralis, Boisd., figured; *id.* *l. c.* pl. lxxvii. fig. 6.

Chærocampa lucasi, Walk., is hardly distinct from *C. cretica*, Boisd.; C. Hopffer, S. E. Z. xxxv. p. 130.

Deilephila euphorbie; transformations, W. Buckler, Ent. M. M. xi. pp. 73-77. *D. galii*: H. B. Möschler agrees with Von Prittwitz that *D. chamaeneri*, Harr., is only a variety; S. E. Z. xxxv. pp. 157 & 158.

Darapsa hypothous, Walk., is referred to the genus *Daphnis*; C. Hopffer, *l. c.* p. 42.

Philampelus vitis, L., and *linnei*, Grote. Synonymy discussed by H. B. Möschler, *l. c.* pp. 303-307.

Daphnis nerii. On its occurrence in Siebenburgen; C. Fuss, Verh. siebenb. Ver. xxiii. pp. 22-24.

Sphinx. Description of a supposed new larva (not bred) which curved itself into a ring like the larva of a *Cimex*, and was armed with a pair of powerful tridentate mandibles, which it used freely and indiscriminately; T. G. Gentry, Canad. Ent. vi. pp. 41-43 [can this larva be Lepidopterous?]. On the moultings of a South African species; M. E. Barber, Tr. E. Soc. 1874, p. 521. *S. coniferarum*, A. & S.: H. Strecker,

Lepidoptera, p. 93. *S. ello*: ravages of larva in manioc plantations in Guiana; Bar & Oberthur, Pet. Nouv. vi. p. 383. *S. pinastri*; Sepp's account of its metamorphoses is translated by E. Birchall, Ent. vii. pp. 149-154. *S. 5-maculata*; varieties of larva, T. G. Gentry, l. c. pp. 88 & 89. *S. sequoia*, Boisd., re-described; H. Edwards, P. Cal. Ac. v. p. 110. *S. sesquiplea*, Boisd., figured by Felder, l. c. pl. lxxviii. fig. 5. *S. snelleni*, Weyenbergh, Mus. Teyl. ii. p. 261, pl. xxxiv. figs. 9 & 9a (wing), 10 & 10a (larva ?), from the lithographic chalk, Bavaria [it is incorrectly noticed as *S. snelli*, in Z. R. ix. p. 355]. A supposed fossil *Sphinx*, previously recorded by Schroeter, is probably Hemipterous. On the supposed resemblance of *S. snelleni* to the *Hymenoptera*; id. l. c. iii. pp. 236-239.

Acherontia lachesis, Fabr., var. from Celebes; C. Hopffer, l. c. p. 42.

Smerinthus amboinicus, Feld., pl. lxxviii. fig. 1, and *dumolini*, Guér., pl. lxxxii. fig. 2, figured by Felder, l. c. *S. dyras*, Walk., = *S. sperchius*, Mén.; C. Hopffer, l. c. p. 43. *S. kindermanni*, Led., figured; N. Erschoff, Lep. Turk. pl. ii. fig. 19. *S. pallens*, Streck., = *S. juglandis*, A. & S.; A. R. Grote, Canad. Ent. vi. pp. 171 & 199.

Smerinthus populi and *ocellatus*. Their parthenogenesis noticed; Frey & Wulschlegel, MT. schw. ent. Ges. iv. p. 210.

Callenyo, g. n., A. R. Grote, Bull. Buff. Soc. i. p. 279 (= *Enyo*, groups 3 & 4, Walk.); type, *Sph. chloroptera*, Perty [= *Aleuron*, Boisd., Lep. Guat. p. 71].

New species:—

Seia grotei, Texas, p. 365, *alternata* and *whitelyi*, Hakodadi, pp. 366 & 367; A. G. Butler, Ann. N. H. (4) xiv.

Hemaris palpalis, A. R. Grote, Bull. Buff. Soc. ii. p. 145, British Columbia.

Lepisesia victoria, id. l. c. p. 147, British Columbia.

Macroglossa fumosa, H. Strecker, Lepidoptera, p. 93, Albany (probably = *Hemaris tenuis*, A. R. Grote, Canad. Ent. vi. p. 199).

Rhamphoschisma rectifascia (Ceylon) and *scottiarum* [Australia], Felder, Reise Novara, Lep. iv. pl. lxxv. figs. 8 & 9.

Perigonia magna, id. l. c. fig. 12 [Peru].

Microlophia (g. n. near *Calliomma*) *sculpta*, id. l. c. fig. 9.

Cornipalpus (g. n. near *Calliomma*) *succinctus*, id. l. c. pl. lxxxii. fig. 6.

Tylognathus (g. n. near *Enyo*) *philampeloides*, pl. lxxv. fig. 11, *scriptor* and *smerinthoides*, pl. lxxxii. figs. 4 & 5, id. l. c.

Stenolophia (g. n. near *Enyo*) *tenebrosa*, id. l. c. pl. lxxxii. fig. 3.

Parapteryx (g. n. near *Ambulyx* ?) *molucca*, id. l. c. pl. lxxvi. fig. 1.

Ambulyx subocellata, pl. lxxvi. fig. 3 [Java, Cochin China], *hyposticta*, pl. lxxvii. figs. 2 & 3, *tigrina* [Venezuela] and *eurysthene* [Columbia], l. c. figs. 4 & 5; id. l. c.

Cherocampa hystrix, id. l. c. pl. lxxvi. fig. 5 [Amazon region].

Pergesa fusimacula, id. l. c. fig. 4.

Deilephila bienerti, O. Staudinger, S. E. Z. xxxv. p. 91, Persia.

Philampelus (Dupo) *mirificatus*, A. R. Grote, Bull. Buff. Soc. ii.

p. 148, Cuba; *P. dolichoides*, pl. lxxvi. fig. 8 (*Peryesa dolichoides*, F. Moore, P. Z. S. 1874, p. 577), Himalaya, and *orientalis*, pl. lxxvii. fig. 1, Felder, l. c.

Daphnis angustans [Amboina] and *protrudens* [Gilolo], Felder, l. c. pl. lxxvi. figs. 6 & 7.

Zonilia malgassica, id. l. c. fig. 2 [Madagascar].

Sphinx distans, A. G. Butler (? = *S. convolvuli*, var.), Lep. N. Zeal. p. 4, pl. ii. fig. 11, New Zealand; *S. eremitoides*, H. Strecker, l. c. p. 93, Kansas (? = *S. lugens*, Walk.; A. R. Grote, Canad. Ent. vi. p. 199); *S. perelegans* and *oreodaphne*, p. 109, California; *S. vancouverensis*, p. 111, Vancouver's Island, H. Edwards, P. Cal. Ac. v.; *S. lanceolata*, fig. 3 Guatemala], and *analis* [Shanghai], fig. 4, Felder, l. c.

Smerinthus heuglini, pl. lxxviii. fig. 2, and *pusillus*, pl. lxxxiii. fig. 1, Felder, l. c.

Ceratonia hageni, A. R. Grote, Bull. Buff. Soc. ii. p. 149, Texas.

ÆGERIIDÆ.

Ægeria. A. G. Butler (Ann. N. H. (4) xiv. pp. 407 & 408) notices several of Walker's species, as follows:—*Æ. agathiformis* and *agriliiformis* are overlooked by Staudinger; *pleciiformis* and *emphytiiformis* belong to *Tarsa*; *tryphoniformis*, *plectisciformis*, and *ischniformis* are the same species; *leiiformis* and *cupreipennis* belong to *Tinthia*; *cryptiformis* belongs to *Sannina* (type, *exitiosa*, Say, = *uroceriformis*, Walk.); *crassicornis* perhaps belongs to *Sincara*, and *gravis* and *bicincta* belong to *Sciapteron*. *Æ. basalis*, ♀ (nec ♂), from Ega, is re-named *confusa*; it is probably a *Sincara* (p. 409).

A. Gartner, Verh. Ver. Brünn. xii. Heft 2, pp. 21–49, describes 15 species occurring in the Brunn district.

Ægeria acerni, Clem. Transformations described and figured by C. V. Riley; Rep. Ins. Mo. vi. pp. 107–110.

Sesia apiformis: habits; W. C. Marshall, Ent. M. M. x. p. 181. *S. chrysidiformis*, var. *turanica*, described and figured by N. Erschoff, Lep. Turk. p. 26, pl. v. fig. 74, from Turkestan. *S. culiciformis*: the var. with yellow belts occurs in the proportion of 1 in 25; Bird, P. E. Soc. 1874, p. xxiii. *S. longipes*, Felder, figured by him under the new generic name of *Teinotarsina*; Reise Novara, Lep. iv. pl. lxxv. fig. 2.

Pseudosetia insularis, Felder, figured; l. c. fig. 3.

Platythiris. This name must be retained, as *Dysodea*, Clem., previously applied to this genus, is pre-occupied. Walker's type of *Varnia* appears to be distinct. There is probably but one species in N. America, described as a *Tortrix* by Clemens. Boisduval's *vitrina* is distinct. A. R. Grote, Canad. Ent. vi. p. 171.

Euryphrissa, g. n., A. G. Butler, Ann. N. H. (4) xiv. p. 409. Allied to *Ægeria*; type, *Æ. plumipes*, Walk.

Tarsopoda, g. n., id. l. c. p. 410. Allied to *Ægeria*; type, *T. lanipes*, sp. n., l. c. Villa Nova.

Eublepharis (g. n. near *Paranthrene*) *ruficincta*, sp. n., Felder, Reise. Novara, Lep. iv. pl. lxxv. fig. 4.

Trochilina (g. n.) *candescens*, sp. n. *id. l. c. pl. lxxxii. fig. 23.*

Austrosetia (g. n.) *semirufa*, sp. n., *id. l. c. pl. lxxxii. fig. 22.*

Desmopoda (g. n. near *Melittia*) *bombiformis*, sp. n., *id. l. c. pl. lxxv. fig. 5.*

Pachythiris (g. n. near *Platythiris*) *siculoideus*, sp. n., *id. l. c. fig. 1.*

Egeria rubi, C. V. Riley, Rep. Ins. Mo. vi. pp. 111-113, fig. United States; *Æ. modesta*, Espirito Santo, and *deceptura*, Santa Marta, A. G. Butler, *l. c. pp. 408 & 409 : spp. nn.*

Trochilium acericulum, sp. n., P. Germadius, Am. Nat. viii. p. 57, Illinois (= *Egeria acerni*, Walk. ; C. V. Riley, *op. cit. pp. 123 & 124.*)

URANIIDÆ.

J. A. Boisduval, Monographie des Agaristidées (Lépidoptères), R. Z. (3) ii. pp. 26-110, proposes the following arrangement of this and the allied groups:—Agaristidées: *Uranides*, *Cydimonides*, *Nyctalemonides*, *Cocytides*, and *Agaristides*.

Urania rhipheus, Stoll. Sgunzin's remarks on its transformations, and on a smaller species from Sainte Marie, probably new ; *id. l. c. pp. 29-31.* Drury's *rhipheus* is probably another species, but is absurdly re-named *U. druryi*, although it has 9 years' priority over Stoll's figure, *id. l. c. pp. 33 & 34.* Cf. also A. R. Grote, Canad. Ent. vi. p. 180.

Cydimon amphielus, Boisd. (= *C. leilus*, var. *amphielus*, Guén.), is probably a distinct species ; J. A. Boisduval, *l. c. p. 36.*

Nyctalemon patroclus, Drury (*nec* Linn.), is re-named *crameri* ; *id. l. c. p. 44* [= *zampa*, Butl. ; cf. Z. R. vi. p. 384]. *N. patroclus*, Drury, = *meneti*, Hopff. ; C. Hopffer, S. E. Z. xxxv. p. 47.

Sematura empedocles, Cram., = *lunus*, Linn., ♀ ; *S. selene*, Guén., is probably a Darwinian modification of *lunus* ; the ♂ of *phæbe*, Guén., is also described ; A. Guénée, Ann. Soc. Ent. Fr. (5) i. v. pp. 117 & 118.

Coronis dutreuxi, E. Deyrolle, R. Z. (3) ii. pl. viii. fig. 3, Costa Rica.

CASTNIIDÆ.

A. Guénée now refers the *Uranides* and *Hazides* to the neighbourhood of the *Agaristides* ; Ann. Soc. Ent. Fr. (5) iv. p. 117.

Alypia, *Eudryas*, and *Psychomorpha*. On the larvae ; C. V. Riley in Stretch's Zyg. & Bomb. N. A. i. p. 233 ; also J. A. Lintner, Rep. N. York Mus. xxvi. pp. 117-124, who discusses the larvae of *E. unio* and *grata*, *A. 8-maculata* and *P. epimenis*, and adds figures of the last three species in various stages.

Tyndaris letifica, Felder, figured ; Reise Novara, Lep. iv. pl. cvii. figs. 18-20.

Amazela calisto (= *Apina callisto*, Walk.) re-described as a new genus and species ; J. A. Boisduval, R. Z. (3) ii. p. 66.

Agarista guttata, Boisd., is a species of *Callimorpha* ; *id. l. c.*

Alypia bimaculata, H. S., re-named *trimaculata* ; *id. l. c. p. 65.* *A. langtoni*, Coup., p. 210, fig. 3, and *maccullochi*, Kirby, p. 211, fig. 2, figured and re-described by R. H. Stretch, Zyg. & Bomb. N. Amer. i. pl. viii. *A. langtoni*, Coup., may = *sacramenti*, Grote ; H. Strecker,

Lepidoptera, p. 79. *A. lunata*, Stretch, = *mariposa*, Grote, var.; Stretch, l. c. p. 234. *A. 8-maculata* and *Agarista casuarinæ*: larvæ figured; id. l. c. pl. x. figs. 10 & 11. *A. 8-maculata*; transformations described by C. V. Riley, Rep. Ins. Mo. vi. pp. 94-96. *A. sacramenti* simulates death in the net; H. Edwards, P. Cal. Ac. v. p. 183.

Charilina, Walk. (*Callimorphidæ*), re-characterized as new, for reception of *amabilis*, "Boisd." (Drury), and *decora*, Linn. [*Pais decora* of Hübner & Walker; if the two genera are to be combined, *Pais* must of course be retained]; J. A. Boisduval, l. c. p. 56.

New genera and species.

Pseudaltypia, H. Edwards, P. Cal. Ac. v. p. 101; type, *P. crotchii*, sp. n., l. c.; Stretch, Z. & B. N. Amer. p. 214, pl. ix. fig. 2, California.

Pycnodontis (near *Agarista*) *spadicea* and *leuconoe*, Felder, Reise Novara, Lep. iv. pl. cvii. figs. 12 & 13.

Arctioneura (near *Eusemia*?) *lorquini*, id. l. c. fig. 16.

Agonis (near *Callidula*) *lycænoides*, id. l. c. fig. 21.

Cleis plagalis, *erycinoides* (? = *Callidula erycinoides*, Walk.), and *versicolor*, id. l. c. figs. 22-24.

Callidula jucunda, id. l. c. fig. 25.

Castnia rutila, *zagræa*, *tricolor*, *mimica*, and *unifasciata*, id. l. c. pl. lxxix. figs. 1-5.

Synemon icaria, fig. 6, and *parthenoides*, figs. 7 & 8, pl. lxxix. and *hesperioides*, pl. lxxxii. fig. 12, id. l. c.

Agarista cincta (? = *lincea*, var.), Gilolo, *linceoides*, New Guinea, *fimbriata*, fig. 1, Philippines, and *xanthomelas*, fig. 2; J. A. Boisduval, R. Z. (3) ii. p. 80, pl. viii.

Amazela echione, id. l. c. p. 67, South Africa.

Eusemia lambertiana and *irenea* (Dehaan, MS.), pp. 83 & 84, Timor or Sumatra, *rosenbergi*, p. 94, Amboina, Ceram (*Agarista rosenbergi*, Felder, Reise Novara, Lep. iv. pl. cvii. fig. 1), *clymene* (Dehaan, MS.), p. 97, Java or Sumatra, *arruana*, p. 100, Aru, *semperi* (*Ag. semperi*, Feld., l. c. fig. 4) & *lethe* (*Ag. lethe*, Feld., l. c. fig. 7), Celebes, *doleschalli*, Amboina, p. 101 (*Ag. doleschalli*, Feld., figs. 2 & 3), *moorii*, p. 102 (*Ag. moorii*, Feld., fig. 5), *batesi* (*Ag. batesi*, Feld., fig. 8), *lindigi*, p. 103 (*Ag. lindigi*, Feld., fig. 6), *flavo-ciliata*, p. 104, all from the Philippines, *radians*, p. 105, Moluccas (*Ag. radians*, Feld., fig. 9), *ægoceroïdes* (*Ag. ægoceroïdes*, Feld., fig. 10), *sabulosa*, p. 106, locality unknown (*Ag. sabulosa*, Feld., fig. 11), Boisduval, l. c.

Massaga virescens, A. G. Butler, Lep. Ex. p. 175, pl. lxi. fig. 15, Fantee, Gold Coast; *monteironis*, id. Cist. Ent. i. p. 214, Cabinda.

Egocera rubida, Cazamañca, and *trimeni*, locality unknown: J. A. Boisduval, l. c. pp. 53 & 54; Felder, l. c. pl. cvii. figs. 14 & 15.

Allypia edwardsi, Boisduval, l. c. p. 63, N. America [= *similis*, Stretch].

Eudryas assimilis (Doubl., MS.), Georgia (= *grata*, Fabr.; A. R. Grote, Canad. Ent. vi. p. 180), and *bartholomæi*, Island of St. Bartholomew, J. A. Boisduval, l. c. p. 59.

Charilina intercisca, Felder, l. c. pl. cvii. fig. 17.

ZYGÆNIDÆ.

Zygæna lonicera, Esp., *filipendula*, L., *stæchadis*, Borkh., and *dubia*, Staud., appear to be all forms of one species; Standing & Frey, MT. schw. ent. Ges. iv. pp. 224 & 225. *Z. medicaginis*, O., *hippocrepidis*, Hüb., and probably also *angelica*, O., are forms of one species; H. Frey, l. c. pp. 225 & 226. *Z. hippocrepidis*: a var. described by E. Lelièvre, Pet. Nouv. vi. pp. 432 & 433. *Z. lonicera*: on breeding; G. T. Porritt, Ent. vii. pp. 109 & 110. *Z. olivieri*, Bois.: N. Erschoff describes and figures a variety from Turkestan; Lep. Turk. p. 28, pl. ii. fig. 21. *Z. trifolii*: larva described; G. T. Porritt, l. c. p. 90; an hermaphrodite (right side ♂, var. *orobi*, left side ♀, var. *confluens*) described by A. Speyer, S. E. Z. xxxv. pp. 98-103.

Procris ampelophaga recorded as new to France; Pet. Nouv. vi. p. 379.

Syntomis phegea undoubtedly taken at Dover; W. H. Tugwell, Ent. vii. pp. 88 & 89.

Dysauxes mediastina, Hüb., occurs in New South Wales, not America; R. H. Stretch, Canad. Ent. vi. p. 119.

Euchromia scintillans, A. G. Butler, figured; Lep. Ex. pl. lxi. fig. 16.

Gymnelia jansonis, Butl. & Druce, figured, l. c. fig. 17.

Rhaphidognatha setiformis, Felder, figured; Reise Novara, Lep. iv. pl. lxxxiii. fig. 1.

Felder (l. c.) figures the following new species:—*Euctonia zygænoides*, pl. lxxxii. fig. 21, *Acreagris correbioides*, *Pycnoctena angustula*, *Callizygæna nivimacula*, and *Netrocera setioides*, pl. lxxxiii., figs. 2-5. Also (l. c. pl. cii. figs. 13-38) *Cacosoma naclioides*, *Eutomis* (°) *eucyane*, *Cyanopepla* (°) *quadricolor* and *eucyane*, *Eriphia ustulata*, *Eucerea* (°) *thalassina*, *Zygænonopsis squamicornis*, *Dycladia correbioides*, *Glaucoptis* (°) *eburneifera*, *Gymnopoda ochracea* and *corallonota*, *Scytale platygona*, *Dasysphinx muscenscens*, *Homæocera crassa*, *Isanthrene* (°) *acutior*, *Dipteromorpha adnota*, *Sphecopis hyalozona*, *Rhyncopyga ichneumonea*, *Telioneura glaucopsis*, *Euchromia* (°) *bogotensis*, *Cosmolopha australis*, *Sphenoptera triangulifera* and *batesi*, *Anaphlebia caudatula*, *Pseudomya* (°) *biradiata*, and *Polyphelebia atychioides*. All the generic names, except those marked with an asterisk, appear to be new.

Zygæna subdiaphana, *ocellaris*, and *ochroptera*, Felder, l. c. pl. lxxxii. figs. 18-20; *Z. sogdiana*, p. 27, fig. 20, Tashkend, *cocandica*, and var. *minor*, pp. 28 & 29, figs. 22 & 23, Khokand, N. Erschoff, l. c. pl. ii.; *Z. ochreipennis*, A. G. Butler, Cist. Ent. i. p. 215, Ambriz: spp. nn.

Syntomis bactriana, *maracandica*, and var. *cocandica*, N. Erschoff, l. c. pp. 29-31, pl. ii. figs. 24-26, Turkestan; *S. acrospila* and *marcescens*, Felder, l. c. pl. cii. figs. 11 & 12.

NYCTEOLIDÆ.

Sarothripa musculana, N. Erschoff, Lep. Turk. p. 31, pl. ii. fig. 27, Sarafschan; *S. columbiana*, H. Edwards, P. Cal. Ac. v. p. 184, Victoria, Vancouver's Island; *S. indica*, Felder, Reise Novara, Lep. iv. pl. cvi. fig. 19, India.

Eurias plaga, Felder & Rogenhofer, op. cit. pl. cviii. fig. 20, S. Africa.

LITHOSIIDÆ.

A preliminary list of the *Lithosiidæ* of the United States; A. R. Grote, Bull. Buff. Soc. ii. pp. 151-153.

R. H. Stretch (Zyg. & Bomb. N. Amer. pl. x.) figures the larva and pupa of *Phryganidia californica*, figs. 4 & 5, and the larvæ of *Harrisina americana*, fig. 8, and *Psychomorpha epimenis*, fig. 11.

Ctenucha virginica, Charp. Larva described; J. A. Lintner, Rep. N. York Mus. xxvi. p. 155.

Scepsis fulvicollis and allies fly only by day. *Solidago* is attractive to them; *id. l. c.* p. 156.

Harrisina texana, R. H. Stretch, figured by him; *l. c.* pl. viii. fig. 1.

Psychomorpha epimenis. Transformations figured and described by C. V. Riley, Rep. Ins. Mo. vi. pp. 87 & 88.

Diophtis noctiluces and *ithomeina*, A. G. Butler, figured by him, Lep. Ex. pl. lxi. figs. 7 & 8; also by Felder, Reise Novara, Lep. iv. pl. cv. figs. 5 & 4, as *D. salvini* and *erycinoides* respectively.

Esthema confluens, Butler, figured by Felder, *l. c.* pl. ciii. fig. 9.

Anthomyza histrio, *mimica*, and *salvini*, Butler, figured; *l. c.* figs. 5, 6, & 8.

Gyara clara, Butler, figured by him; Lep. Ex. pl. lxi. fig. 13.

Pericopsis lucifer, *fantasma*, *flora*, *leonina*, *irenides*, and *sibylla*, Butler, figured by him; *l. c.* figs. 1, 2, 9-12.

Eucyane hystaspes, Butl., figured; *l. c.* fig. 6.

Chrysauge lutescens, Butl., figured; *l. c.* fig. 14.

Leptosoma maculosum, Walk., figured by Felder, *l. c.* pl. ciii. fig. 2.

Lithosia. *L. molybdeola*, Guén. (= *sericea*, Gregs.), probably = *complanata*, L., var.; *L. stramineola*, Doubl., = *L. griseola*, Hübn., var.; C. G. Barrett, Tr. Norw. Soc. 1873-1874, Suppl. p. 13. *L. argillacea*, A. S. Packard, figured; Hayden's Rep. U. S. Survey, 1873, Moths, fig. 15. *L. quadra*: natural history; W. Buckler, Ent. M. M. x. pp. 217-220.

Calligenia miniata, Forst. Structure of hairs of larva; J. Van Leeuwen, Jun., Tijdschr. Ent. xvii. pp. 218 & 219, pl. xii. figs. 1-8.

Deiopia pulchra. On its time of appearance; CR. Ent. Belg. xvii. pp. xcvi. cvii. & cviii.

R. Felder (Reise Novara, Lep. iv.) figures the following species as new: —*Paraphlebia lithosina*, *Heterusia* (*) *microcephala* and *cicada*, *Gynautocera* (*) *virescens*, *Erasmia* (*) *eusemoides*, pl. lxxxiii. figs. 6-10; *Comptoloma erythropygum*, pl. xciii. fig. 7; *Diabena cincticollis*, fig. 1, *Leptosoma* (*) *tricolor*, fig. 4, *Ctenucha* (*) *bimaculata*, fig. 4, *Anthomyza* (*) *ithomia*, fig. 7, *Esthema* (*) *venosa*, *calida*, and *jucunda*, *Chamesthema diophtis*, *Acribia melanchroia*, *Isostola rhodobroncha*, *Hyalurga* (*) *irregularis*, *Microgiton selene* and *cingulosus*, figs. 10-18, pl. ciii.; *Heleona* (*) *bellicosa*, *bernsteini*, and *cuprina*, *Stenele* (*) *aletis*, *Cozistra* (*) *membranacea*, *Milionia* (*) *pulchrinervis*, *Polyptychia fasciculosa*, *Chatognatha integra*, *Phelodes equatorialis*, *Phanoptis cyanomelas*, *Paratype laticolor*, *Josiomorpha longivitta*, *Terna* (*) *zonata*, pl. civ. figs. 1-13; *Phaeochlæna* (*) *josia*, *Terna* (*) *major* and *minuta*, figs. 1-3, *Diophtis* (*) *phelina*, 1874. [VOL. XI.]

Monocreagra pholcides, *Gnatholophia longinervis*, *Erycinopsis diaphana*, *Anatolis subtilis*, *Atyria simplex* and *reducta*, *Pyralopsis homalochroa*, *Dialeptis salvini*, *Cyrtochila wallacii*, *Stenoplastis satyroides* and *selenia*, *Melanchroia* (*) *rubriplaga*, *Phelloe* (*) *lindigi*, *Nelo* (*) *effulgens* and *subsericea*, *Josia* (*) *lugens*, *Cymopsis fulviceps*, *Evagra* (*) *isthmia*, *Heterodontia tricolor*, *Eurylomia curvinervis*, *Autiotricha venata*, *Marcypophora erycinoides*, *Eudule* (*) *heterochroa*, *Mesenochroa guatemalteca*, *Adelphoneura nerias*, *Micromuria jugifera*, pl. cv. figs. 6–32; *Aganais* (*) *eusemoides*, *renigera*, and *albifera*, *Agape cyanopyga*, *Termessa* (*) *hamula*, *Inopsis catanzantha*, *Cyane* (*) *polygrapha*, *Cratonia parallela*, *Crambomorpha umbrifera* and *argentea*, *Lithosia* (*) *bifasciata* and *angulifera*, *Diastrophia dasypyga*, *Cymella congerans*, *Eutane* (*) *tineoides*, *Setinochroa infumata*, *Chionæma candida*, *Teinopyga reticularis*, figs. 1–18; *Homæognatha spilosoma* and *aganais*, *Ischnocampa sordida*, *Pyralidæ* *deserta*, *Autoceras grammophora*, *Dichromia* (*) *nietheri*, *Ptychoglene erythrophora*, *Nystochroa basiplaga*, *Josiodes batesi*, *Tmetoptera phryganoides*, *Phryganopsis sordida*, *Dyphlebia semiochræa* and *trimeni*, *Eucerebra arcalifera*, figs. 20–33; *Melania* (*) *punctigera*, figs. 34 & 35: pl. cvi.

Atossa, n. g. (*Chalosiidæ*), F. Moore, P. Z. S. 1874, p. 577; type, *A. nelcinna*, sp. n., l. c. pl. lxvii. fig. 7, N. W. Himalayas.

New species:—

Ctenucha walsinghami, H. Edwards, P. Cal. Ac. v. p. 112; Stretch, Z. & Bomb. N. Amer. p. 213, pl. ix. fig. 1, Oregon.

Scepsis matthewi, H. Edwards, l. c. p. 184, Vancouver.

Eucyane egaensis, A. G. Butler, Ent. M. M. xi. p. 77, Ega.

Aganais celebensis, C. Hopffer, S. E. Z. xxxv. p. 43, Celebes.

Leptosoma infuscatum [-um], p. 44, *consobrina* [-um] and *latifascia* [-tum], p. 45; id. l. c. Celebes.

Epicopia mencia, F. Moore, l. c. p. 578, pl. lxvii. fig. 8, Shanghai.

Clemensia irrorata, H. Edwards, l. c. p. 185, Vancouver's Island.

Lithosia candida, id. l. c. p. 185, Vancouver's Island.

Calligenia (?) *apicalis*, P. C. Zeller, Verh. z.-b. Wien, xxiv. p. 434, pl. xii. fig. 1, Batafago.

ARCTIIDÆ.

J. A. Lintner (Rep. N. York Mus. xxvi.) remarks on *Callimorpha leontii* (variation and larva), pp. 142 & 143, *Arctia arge* and *Spilosoma virginicum* (larva described), pp. 143 & 144, *S. latipennis* (amended description), p. 144, *Euchaetes oregonensis*, pp. 144–146; *E. collaris*, Fitch (= the so-called white var. of *E. eggle*, but is undoubtedly distinct), pp. 146–148; *Halesidota caryæ* (cocoon noticed), p. 148.

Short notices of various Western American *Bombyces*, chiefly *Arctiidæ*; H. Edwards, P. Cal. Ac. v. pp. 186–189.

R. H. Stretch (Zyg. & Bomb. N. Amer. i. pl. x. figs. 1–3, 6 & 7) figures the larvæ of *Epicalia virginialis*, *Halesidota edwardsi*, *Arachnis picta*, *Leucarctia nexa*, and *H. agassizi*.

Trichiosoma pierreti and allies; J. Fallou, Bull. Soc. Ent. Fr. (5) iv. pp. ccxxxii. & ccxxxiii.

Arctia. R. H. Stretch (*l. c.*) figures and re-describes *A. virguncula*, Kirby (*nec* Walk. & Saund.), p. 218, fig. 5, *anna*, Grote, p. 220, fig. 6, *quenseli*, Payk., p. 222, fig. 8, *blakei*, Grote, p. 224, fig. 9, *arge*, Drury, p. 225, figs. 10 & 11, pl. ix. *A. arge*: larva noticed; S. H. Peabody, *Canad. Ent. vi.* p. 98. *A. behri*, Stretch, = *nevadensis*, Grote; R. H. Stretch, *l. c.* p. 238. *A. caja*: parthenogenesis noted; Frey & Wullschlegel, *MT. schw. ent. Ges. iv.* p. 210. *A. lubricipeda*: var. figured and described by G. R. Dawson & E. Newman, *Ent. vii.* p. 169. *A. quenseli*, Payk., occurs on mountains of Colorado; A. S. Packard, *Hayden's Rep. U. S. Surv.*, 1873, pp. 558 & 559; its supposed larva, found on larch, figured (fig. 14). *A. speciosa*, Möschl., is a good species; H. B. Möschler, *S. E. Z. xxxv.* p. 158.

Euprepia americana is only a slight variety of *E. caja*; *id. l. c.* p. 152.

Antarctia vagans, Boisd. (of which *rufula*, Boisd., and *punctata*, Pack., are vars.), figured and described by R. H. Stretch, *l. c.* p. 192, pl. viii. figs. 8–12.

Nemeophila plantaginis. On its variation in Europe and America; H. Strecker, *Lepidoptera*, pp. 79 & 80.

Leptarctia lena, Stretch, = *Nemeophila californica*, Walk.; Stretch, *l. c.* p. 240.

Callimorpha leontii, Boisd., type form, and var. *contigua*, Walk., figured and described by R. H. Stretch, *l. c.* p. 237, pl. ix. figs. 13 & 14.

Spilosoma conspurcatum, Walk., = *S. maculifascia*, Walk.; C. Hopffer, *S. E. Z. xxxv.* p. 43. *S. melanostigma*, N. Erschoff, figured and re-described; *Lep. Turk.* p. 33, pl. ii. fig. 30.

Euchætes. R. H. Stretch gives a table of five N. American species, and re-describes and figures *E. egle*, Drury, and *collaris*, Fitch; *Zyg. & Bomb. N. Amer.* pp. 185–188, pl. viii. figs. 4 & 5.

Leucarctia acraea. Abdominal appendages of ♂ (also present in *Danaïs chrysippus*, *Agrotis plecta*, and *Euplexia lucipara*) noticed by H. K. Morrison, *Psyche*, i. pp. 21 & 22.

Hyphantria cunea, Drury, figs. 18–20, and *textor*, Harris, fig. 21; figured and re-described by R. H. Stretch, *l. c.* pp. 205 & 206, pl. viii.

Aloa vacillans, Walk., = *Amphissa vacillans*, Walk.; C. Hopffer, *l. c.* p. 43.

New species :—

Felder (*Reise Novara, Lep. iv.*) figures the following as new :—*Ochrogaster* (*) *circumfumata*, *Antheua* (*) *tricolor* and *sericea*, pl. xciv. figs. 5, 7 & 8, *Callioratis abraxas* and *boisduvali*, *Zerenopsis leopardina*, *Dryptychia geometrina*, *Aloa* (*) *undistriga*, *Macronyx debilis*, pl. c. figs. 17–22; *Sarothropyga rhodopepla*, pl. c. fig. 23 and pl. ci. fig. 13; *Arctia* (*) *parvula* and *rhodolopha*, *Isochroa eburneigutta* [= *Enydra phedonia*, Cram.] and *Lomasipilis pantheraria*, pl. ci. figs. 24–27; *Panthea* (*) *chavannesi*, *Ecantheria* (*) *ochreatea*, *Carcinopyga lichenigera*, *Aloa* (*) *callisoma*, *Lophocampa* (*) *elongata*, *nervosa*, *melaleuca*, and *atrata*, *Sthenognatha gentilis*, *Sallæa ochrostoma*, *Meringocera plutonica*, *Arctia* (*) *thibetica*, and *æruginea*, pl. ci. figs. 1–12 & 14; *Symphlebia lophocampoides*, *Iochnognatha semiopalina*, *Eucyrta subulifera*, *albicollis*, *prætexta*, *geo-*

metrica, and *lurida*, *Cratoplastis diluta*, *Euplocia* (*) *vittigera* and *ochrophila*, pl. cii. figs. 1-10; *Halesidota* (?) (*) *leucanina*, Felder & Rogenhof, pl. cix. fig. 1, Bogotá.

Arctia intermedia, p. 216, fig. 3, Texas, *arizonensis*, p. 217, fig. 4, and *yarrowi*, p. 221, fig. 7, Arizona, *superba*, p. 227, fig. 12, Vancouver's Island, R. H. Stretch, Zyg. and Bomb. N. Amer. i. pl. ix.; *A. guttata*, N. Erschoff, Lep. Turk. p. 32, pl. ii. fig. 28, Sarafschan.

Spilosoma turensis [-se], id. l. c. p. 33, pl. ii. fig. 29, Kisil-kum.

Euchaetes oregonensis, p. 187, fig. 7, Oregon, and *elegans*, p. 189, fig. 6, California, Stretch, l. c. pl. viii.

Leucarctia albida, id. l. c. p. 203, pl. viii. fig. 12, California, Costa Rica.

LIPARIDÆ.

Habits of an Australian processionary caterpillar; M. Girard, Bull. Soc. Ent. Fr. (5) iv. p. xxxi.

Orgyia gonostigma, food-plant; H. Robinson, J. R. S. Clifford, & J. R. Wellman, Ent. vii. pp. 204, 226 & 227. *O. leucostigma*, A. & S., assembling; J. A. Lintner, Rep. N. York Mus. xxvi. p. 148.

Parorgyia parallela, G. & R. Larva described; id. l. c. pp. 129 & 130.

Ornithopsyche hypoxantha, Wallengren, ♀ figured by Felder, Reise Novara, Lep. iv. pl. c. fig. 4.

Leucoma flavosulphurea, N. Erschoff, figured and re-described; Lep. Turk. p. 35, pl. iii. fig. 34.

Liparis dispar. On its former occurrence in Norfolk; C. G. Barrett, Tr. Norw. Soc. 1873-74, Suppl. pp. 14 & 15.

Porthesia chrysorrhæa. Larva injurious to plum-trees in Galicia; M. Nowicki, Verh. z.-b. Wien, xxiv. p. 367. Notes by J. R. S. Clifford, Ent. vii. pp. 22, 129 & 130.

Asthenia geometraria, Felder, figured by him, l. c. pl. xcii. fig. 2.

Eladyophthalma tricolor, Feld., figured, id. l. c. pl. xc. fig. 7.

New species:—

Felder (Reise Novara, Lep. iv.) figures the following as new:—*Oligochlena cordigera*, pl. xciv. fig. 10; *Brachyptera phalanaria* and *æqualis*, *Stenoglene hilaris* and *tristis*, *Lichnopteryx* (*) *despecta*, *Cercophana* (*) *frauenfeldi*, figs. 1-6, *Oligochlena nervosa*, *Ochrogaster* (*) *raptimacula*, *Mesotages trilimula*, figs. 8-10, *Parathyris* (*) *bombycina*, figs. 11 & 12, *Microplastis configurata*, *Orgyopsis similis*, *Hygochroa* (*) *vulnerata*, *Spanochroa blandiatrix*, *Leucaniochroa lignosa*, figs. 13-17, pl. xc. v.; *Darala* (*) *rubeola*, *chalepteryx*, and *undulata*, *Chærotricha conspersa*, *globifera*, *glandulosa*, *distincta*, *leucospila*, and *nobilis*, *Micromorpha chærotricha*, *Brihaspa* (*) *atristigmella*, pl. xc. viii. figs. 9-19; *Darala* (*) *zonata*, *Lymantria* (*) *micans* and *pusilla*, *Dasychira* (*) *merens*, *Arestha* (*) *prænota*, pl. xc. ix. figs. 1-5; *Cænina leucogramma*, *Cataphractes boltingi*, *Xenosoma nigricosta* and *erycinoides*, *Geometrodes mimica*, *Microrgyia amazonum*, *Hysterocladia coralloccera*, *Omphaliodes nana* and *quadristrigata*, *Zagaris* (*) *crassa*, *Iochroa chlorogastra*, *Antiophlebia bracteata*,

Darcotina cinerosa, *Chetoloma actinobula*, *Pachyplastis apicalis*, *Desmoloma styraisis*, *Leiosoma serpentinum*, *Agaposoma marcescens*, *Orgyioides tapicoloria*, pl. xcix. figs. 7-25; *Bombycomorpha nupta*, *Dichreagra ochrocephala*, *Ornithopsyche* (*) *anthoca*, figs. 1-3, *Anomæstes levis*, *Tearosoma aspersum*, *Dicranuropsis vilis*, figs. 5-7, pl. c., and *Ceroctena* (*) *pictipennis*, Felder & Rogenhofer, l. c. pl. cxix. fig. 3, Cayenne. [The last figure is taken from a faded specimen, in which the dark green portions have changed to olive yellow.]

Orgyia badia, H. Edwards, P. Cal. Acad. v. p. 188, Vancouver's Island.

Dasychira grænlantica, A. v. Homeyer, Die zweite deutsche Nordpolarfahrt, ii. p. 409, East Greenland.

Ocneria sartus, N. Erschoff, Lep. Turk. p. 36, pl. ii. fig. 32, Tashkend, Maracand.

Lymantria inhononata, C. Hopffer, S. E. Z. xxxv. p. 44, Celebes.

Darala limonea, A. G. Butler, Cist. Ent. i. p. 291, Rockhampton.

PSYCHIDÆ.

Psyche quadrangularis, Christoph, re-described by O. Staudinger, S. E. Z. xxxv. p. 92.

Eceticus kirbii. Transformations, habits, and literature; C. Berg, S. E. Z. xxxv. pp. 230-237, Bol. Ac. Cordova, i. pp. 81-95.

Felder (Reise Novara, Lep. iv.) figures as new *Perophora* (*) *strigifera* and *sanguinolenta*, pl. xcii. figs. 3 & 4; *Eumeta* (*) *nietneri* and *Psychoglene basinigra*, pl. lxxxiii. figs. 21 & 22.

NOTODONTIDÆ.

[For *Demas* and allies, cf. NOCTUIDÆ.]

J. A. Lintner (Rep. N. York Mus. xxvi.) describes the larvæ of *Apatelodes angelica*, Gr., *Cælodasys unicornis*, S. & A. (fig. 6), *Platycerura furcilla*, Pack. (fig. 7), and *Dryocampa rubicunda*, Fabr., pp. 100-134; *Natada gibbosa*, S. & A. (fig. 8), *Notodonta* sp. (figs. 9 & 10), and *Cerura borealis*, Boisd. (fig. 11), pp. 150-152; and notes the habit of the pupa of *Edema albifrons*, S. & A., p. 151.

Harpyia furcula. Var. n. *ajuta*, from N. Finland, described; J. G. Schilde, S. E. Z. xxxv. p. 59.

Platycerura furcilla figured and re-described by R. H. Stretch, Zyg. & Bomb. N. Amer. i. p. 230, pl. ix. fig. 15.

Cnethocampa pityocampa reputed British; T. Batchelor & E. Newman, Ent. vii. pp. 81-83. Habits at Nice; H. Wittich, op. cit. pp. 104 & 105.

Notodonta bicolora: on its occurrence in the British Islands, cf. Ent. M. M. x. pp. 180, 212, 213, 230, 253 & 254. *N. californica*: larva figured; R. H. Stretch, Zyg. & Bomb. N. Amer. i. pl. x. fig. 9. *N. carmelita*: vars. of larvæ described; E. B. Poulton, Ent. vii. pp. 176 & 177.

Acrosoma amboinæ, Feld., *Ortholomia moluccana*, Feld., *Alene mendosa*,

Hübner, and *Chaetognatha altrix*, Cram., figured by Felder, Reise Novara, Lep. iv. pl. xcvi. figs. 2 & 3, pl. xcix. fig. 6, and pl. xcvi. fig. 6.

Dryocampa rubicunda, Fabr.: A. R. Grote describes var. n. *alba* from Kansas; Bull. Buff. Soc. ii. p. 153.

Felder (l. c.) figures the following as new:—*Brachylia terebrioides*, *Coryphodema capensis*, *Sulophonotus myrmeleon*, pl. lxxxii. figs. 7–9; *Desmeocrera nugatrix*, pl. xciv. fig. 9; *Acrosoma* (*) *proxima* [-mum], *Hyleora* (*) *sphinx* and *dilucida*, *Dicranura* (*) *argentea*, *Chliana moneta*, *Disco-
phlebia catocalina*, *Teinocladia cuculloid*es and *Antiora* (*) *ampla*, pl. xcvi. figs. 4–13; and *Hyleora* (*) *capucina*, pl. xcvi. fig. 1.

LIMACODIDÆ.

R. H. Stretch (Zyg. & Bomb. N. Amer.) figures and re-describes *Lithacodes rectilinea*, G. & R., and *fasciola*, H. S., pp. 196 & 197; *Lithacodes scapha*, Harr., and *biguttata*, Pack., pp. 200 & 201; and *Parasa chloris*, H. S., p. 209, pl. viii. figs. 13–17.

J. A. Lintner publishes short notes on the larvæ, &c., of *Empretia stimulea*, Clem., *Phobetron pithecium*, S. & A., and *Lithacodes fasciola*, H. S.; Rep. N. York Mus. xxvi. pp. 149 & 150.

Felder (Reise Novara, Lep. iv.) figures as new *Lamprolepis chrysochroa*, *Cænobasis amæna*, *Letois similis*, *Pantoctonia gemmans*, and *Heterolepis leprosa*, pl. lxxxii. figs. 13–17; *Pachylepis limacodina*, *Bombycocera senilis*, *Lithocephala bombycoides*, *Asteria nivosa*, *Closteromorpha reniplaga*, and *Endobrachys revocans*, figs. 12–17; *Isochroma fallax*, figs. 18 & 19; *Lagoa* (*) *pollita*, fig. 20, pl. lxxxiii.

DREPANULIDÆ.

A. R. Grote has published a "List of the North American *Platyptericæ*, *Attaci*, *Hemileucini*, *Ceratocampadæ*, *Lachneides*, *Teredinides*, and *Hepiali*, with notes," including various corrections of synonymy, but no new species; P. Am. Phil. Soc. xiv. pp. 256–264.

Callidrepana saucia, Felder, figured; Reise Novara, Lep. iv. pl. lxxxiii. fig. 11.

Felder (l. c.) figures as new *Homœopteryx syssauroides*, pl. xciv. fig. 6; *Rosema* (*) *demorsa*, *costalis*, and *myops*, pl. xcvi. figs. 11–13.

SATURNIIDÆ.

Platysamia cecropia and *Callosamia promethea*: young larvæ described, pp. 125 & 126. *Actias luna*: transformations described, pp. 126–128; uncertainty of appearance, pp. 152–154. *Telea polyphemus*: note on eggs, p. 152. *Hemileuca maia* with aborted wings, from railway traveling immediately after emergence from cocoon, p. 154. J. A. Lintner, Rep. N. York Mus. xxvi.

Attacus zacateca, Westw., and *Bolocera smilax*, Westw., figured by

Felder, Reise Novara, Lep. iv. pl. lxxxvi. figs. 3 & 4, and pl. lxxxviii. figs. 4 & 5.

Attacus luna, *Telea polyphemus*, and *Eacles imperialis*. Variations in larvæ described; T. G. Gentry, Canad. Ent. vi. pp. 85-88.

Attacus aurota as a silk-producer; M. Girard, Bull. Soc. Acclim. (3) i. No. 3; abstract, Pet. Nouv. vi. pp. 396 & 327.

Telea polyphemus. Range; A. S. Packard, Am. Nat. viii. pp. 243 & 244. Synonymy; A. R. Grote, *op. cit.* pp. 753 & 754.

Attacus promethea assembling; F. E. L. Beal, Am. Nat. viii. pp. 234-236.

Antheraea Cynthia: *Locusta viridissima* devours the larvæ; De Milly, Bull. Soc. Ent. Fr. (5) iv. p. x. It occurs in a wild state in France; H. Lucas, *op. cit.* pp. cclx. & cclxi. *A. pernyi*: rearing, Stierlin, Arch. sci. Nat. xlviii. pp. 72 & 73, G. Jäger & Pfizenmaier, Württ. Nat. J. H. xix. pp. 192-98. xx. pp. 169-176, 271-274 (according to Pfizenmaier, wasps destroy the larvæ), Pet. Nouv. vi. pp. 372 & 373. On a larva surviving the loss of a leg, with no defect in the imago; C. Henry, *op. cit.* pp. 380 & 381. *Bombyx pernyi* and *yamamai*: hybrids, Berce & Goossens, Bull. Soc. Ent. Fr. (5) iv. pp. ccliv. & cclv., cclviii. & cclix. *A. yamamai*: the hatching of the eggs may be retarded without danger by freezing them. On the possibility of acclimatising the species in France; M. Girard, *op. cit.* pp. lxiii., lxxxv., lxxxvi. & cci., CR. Ent. Belg. xvii. pp. xlv.-xlv.; also noticed in Gewerbeblatt aus Württemberg.

Saturnia (Hyperchiria) io described, and larva and both sexes of imago figured by E. B. Reed, Canad. Ent. vi. pp. 227-229.

Euleucophaeus tricolor, Packard, noticed; Hayden's Rep. U. S. Survey, 1873, p. 557, fig. 12.

Eacles imperialis. A supposed case of parthenogenesis; W. V. Andrews, Canad. Ent. vi. p. 17. A larva feeding on walnut presented characters intermediate between this species and *regalis*; hence *regalis* appears to have been evolved from the former by the influence of different food; T. G. Gentry, P. Ac. Philad. 1873, pp. 274 & 275.

Philosamia, g. n., A. R. Grote, P. Ac. Philad. xiv. p. 258. Type, *Phalæna Cynthia*, Dru., to which Grote previously restricted *Samia*, Hübn., in error [*cf.* Zool. Rec. vii. p. 371].

Felder (Reise Novara, Lep. iv.) figures as new:—*Thyella* (*) *zambesie* [= *Bunæa zambesina*, Walk.], *Eochroa trimeni*, *Ormiscodes* (*) *pomona*, *Hyperchiria* (*) *titania*, pl. lxxxv. figs. 5-8; *Attacus* (*) *affinis* and *satyrus*, pl. lxxxvi. figs. 1 & 2; *Bathyphebia aglia*, *Polythysana* (*) *apollina* [? = *cinerascens*, Prittw., var.], *Saturnia* (*) *stoliczka* and *Sagana* (*) *semi-oculata*, pl. lxxxvi. figs. 1-4; *Actias* (*) *idæ* [= *cometes*, Guén.], *Tagoropsis natalensis* and *Cirina* (*) *cana*, pl. lxxxviii. figs. 1-3; *Ludia* (*) *hansali*, *Hyperchiria* (*) *aspera*, *eogona*, *cinctistriga*, *hamata*, *boops*, and *anableps*, pl. lxxxix. figs. 1-7; *H. flexuosa*, *Hemileuca* (*) *rubridorsa*, *Ormiscodes* (*) *fumosa*, *opiolina*, *lasiocampina*, *fraterna*, and *bleptophana*, pl. xc. figs. 1-9; *Hyperchiria* (*) *caudatula*, *Aricia* (*) *batesi* and *aristor*, pl. xci. figs. 1-3; *A. phoenix* [= *semiramis*, Cram.], *Ormiscodes* (*) *trisignata* and *renigera*, *Hyperchiria* (*) *abdominalis*, figs. 1-3, *Brahmæa* (*) *mniszeechi* [? = *japonica*, Butl.], figs. 4-5, *Homochroa* (*) *valida*, fig. 6,

pl. xciii.; *Sphingognatha asclepiades*, *Melanothrix pulchricolor*, *Homochroa* (*) *ornata* and *famula*, pl. xciv. figs. 1-4.

Antheraea confucii, sp. n., F. Moore, P. Z. S. 1874, p. 578, Shanghai.

Eudemonia jehovah [!], sp. n., H. Strecker, Lep. p. 93, Brazil.

Mamillo (rectius *Mimallo*) *curtisea*, sp. n., Wejenbergh, Tijdschr. Ent. xvii. pp. 220-224, pl. xiii., Buenos Ayres (described and figured in all stages).

Hemileuca diana, sp. n., A. S. Packard, Hayden's Rep. U. S. Surv. 1873, p. 557, fig. 13, Colorado.

BOMBYCIDÆ.

An undetermined species from N. Finland; J. G. Schilde, S. E. Z. xxxv. p. 58.

Gastropacha americana. Egg described; H. H. Lyman, Canad. Ent. vi. p. 158. Larva described; J. A. Lintner, Rep. N. York Mus. xxvi. pp. 154 & 155.

Bombyx neustria frequently spins its cocoons in company; M. Girard, Bull. Soc. Ent. Fr. (5) iv. p. clxxxvi.

Trichiura crategi. Habits; G. H. Raynor, Ent. vii. pp. 228 & 229.

Palustra laboulbeni. Habits of larva; Bar, Bull. Soc. Ent. Fr. (5) iv. pp. cxxi. & cxxii.

Tolyte velleda, Stoll. Larva described by J. A. Lintner, l. c. p. 134.

Bombyx mori. Improved ventilation recommended for silk-worm establishments; De Saint-Cricq Casaux, C. R. lxxviii. p. 898. Parthenogenesis; Von Siebold, Bull. Ent. Ital. vi. pp. 219-224.

Adelocephala ruspa, Boisd., = *albo-lineata*, G. & R.; *Ceroderes*, Boisd., = *Syssisphinx*, Walk., to which *A. simalatilis*, G. & R., belongs; A. R. Grote, CR. Ent. Belg. xvii. p. 6, & Canad. Ent. v. p. 227.

Heteropacha, g. n., L. F. Harvey, Bull. Buff. Soc. i. p. 262. Allied to *Gastropacha*; type, *H. rileyana*, sp. n., *id. ibid.* pl. xi. fig. 1, Missouri.

Felder (Reise Novara, Lep. iv.) figures as new:—*Macromphalia chilensis*, pl. lxxxiii. fig. 23, and pl. lxxxiv. fig. 12; *Hydrias* (*) *grammophora* and *ochropyga*, *Dichromonoma majus*, and *Limacodilla picta*, pl. lxxxiii. figs. 24-27; *Gonometa* (*) *postica*, figs. 1 & 2, *Opsirhina* (*) *crinoides*, fig. 3, and *O. flaviscosta*, figs. 4 & 5, *Bombycopsis ochroleuca*, *Titya* (*) *abstersa* and *rubripalpis*, figs. 6-8, *Rhinogyne calligama*, figs. 9 & 10, *Cosmotricha notodontina* and *Hydrias* (*) *rubiginosa*, figs. 11 & 13, pl. lxxxiii.; *Pachypasa* (*) *ferruginea*, fig. 1, and *P. scapulosa*, figs. 2 & 3, *Ctenogyna natalensis*, fig. 4, pl. lxxxv.; *Noctuomorpha hemixantharia*, pl. xciv. fig. 11; *Pterygosoma squamipunctum*, pl. xcvi. fig. 7.

Lasiocampa sordida, N. Erschoff, Lep. Turk. p. 36, pl. ii. fig. 33 (imago) and pl. vi. fig. 95 (larva), Central Asia, sp. n.

Heterocampa subrotata, figs. 2 & 4, Central Alabama, and *celtiphaga*, fig. 3, hab. ?; L. F. Harvey, l. c. p. 263, pl. xi. spp. nn.

HEPIALIDÆ.

Hepialus pulcher, Grote, figured; A. S. Packard, Hayden's Rep. U. S. Survey, 1873, Moths, fig. 11.

Porina signata, Walk., figured by A. G. Butler, Lep. N. Zealand, pl. ii. fig. 8.

Felder (Reise Novara, Lep. iv.) figures as new *Charagia* (*) *fischeri*, *Trichadia umbrifera*, *Pielus* (*) *hydrographus*, pl. lxxx. figs. 1-3; *P. maculosus*, *Charagia* (*) *argyrographa*, *Sudoclitia similis*, pl. lxxxi. figs. 1-3; *Ptycholoma aurifaba*, pl. lxxxii. fig. 11.

[H] *Epialus modestus*, sp. n., H. Edwards, P. Cal. Ac. v. p. 112, California.

ZEUZERIDÆ.

Zeuzera æsculi. Natural history; E. Kalender, S. E. Z. xxxv. pp. 203-206 (figure of burrow of larva).

Phragmataecia castaneæ, Hübner. N. Erschoff describes var. n. *albida* from Turkestan; Lep. Turk. p. 34.

Macrogaster arundinis. Larva described; G. H. Raynor, Ent. vii. pp. 21 & 22.

Cossus ligniperda. Pupation; Peyerimhoff, Bull. Soc. Ent. Fr. (5) iv. p. clxxvii. Transformations figured and described; H. A. Auld, Sci. Goss. 1873, pp. 58-60.

Xystus, g. n., A. R. Grote, P. Am. Phil. Soc. xiv. p. 262. Uncharacterized; type, *Cossus robinia*, Peck.

Felder (Reise Novara, Lep. iv.) figures as new *Endoxyla* (*) *angasi* and *strigillata*, *Pachyphlebius thoracicus*, and *Langsdorfia* (*) *andensis*, pl. lxxxi. figs. 4-7; *Arctiocossus antargyreus*, pl. lxxxii. fig. 10.

Hypopta gloriosa, sp. n., N. Erschoff, Lep. Turk. p. 35, pl. ii. fig. 21, Kisl-kum.

NOCTUIDÆ.

Seven double-brooded European *Noctuidæ* noticed; Fondu, CR. Ent. Belg. xvii. p. cxiii.

List of the *Noctuidæ* of North America; A. R. Grote, Bull. Buff. Soc. ii. pp. 1-77, pl. i.

J. A. Lintner (Rep. N. York Mus. xvi.) describes the larvæ of *Acronycta americana*, Harr. (= *funeralis*, G. & R., = ? *alni*, auctt. Amer.; cf. pp. 157 & 158), *morula*, G. & R., *Ceramica picta*, Harr., *Cucullia convexipennis*, G. & R., and *asteroides*, Guén., and *Catocala* sp., pp. 135-141; *Diphthera deridens*, Guén. (fig. 12), *Acronycta hastulifera* and *oblinita*, and *Hadena adjuncta*, Boisd., pp. 157-161. He also discusses the synonymy of *Agrotis subgothica*, Haw. (= *jaculifera*, Guén.) and allies; re-describes *Cucullia florea*, Guén.; describes the supposed larva of *Chariclea exprimens*, Walk.; and publishes short notes on the cocoons, larvæ, &c., of *Chamyris cerintha*, Tr., *Plusia balluca*, Hübner, and *æroides*, Grote, and *Scoliopteryx libatrix*, L., pp. 159-164.

A. R. Grote revises the genera allied to *Tæniocampa* and *Orthosia*, makes some additions and corrections to his list of N. American *Noctuidæ*, and removes his genus *Nolaphana* from the *Lithosiidæ* to the *Noctuidæ*; l. c. pp. 122-126.

Preliminary list of Californian *Noctuae*; A. R. Grote, *Canad. Ent. vi.* pp. 154-157, 214-217.

List of a collection of Texan *Noctuidæ*, with descriptions of the new species; H. K. Morrison, *P. Bost. Soc. xvii.* pp. 209-221 (55 species).

On species of *Noctuidæ* inhabiting Europe and N. America, and their allies; *id.* *Bull. Buff. Soc. ii.* pp. 193-200; *Rep. Peab. Ac. vi.* pp. 21 & 22; *Canad. Ent. vi.* pp. 117 & 118.

Grote (Descriptions and Notes on *Noctuidæ*, *P. Bost. Soc. xvi.* pp. 239-245) remarks on the following known species, and describes some as new:—*Mamestra legitima*, Grote (*Apamea*, Grote, olim.); *M. laudabilis*, Guén. (*Hecatera*, Guén.); *Hadena arctica*, Boisd.; *Ufeus plicatus*, Grote; *Catocala faustina*, Streck. (from Michigan, ♀ described, p. 243); *Anarta melanopa*, Thunb. (= *nigro-lunata*, Pack.).

Cymatophora, Treitschke. This name must be rejected, as the type of *Cymatophora*, Hübn., is (*Boarmia*) *roboraria*. *Cymatophora*, Tr., may be divided as follows:—Sub-family *Bombyciæ*, Hübn.; *Polyploca*, Hübn. (type, *ridens*), *Asphalia*, Hübn. (type, *ruficollis*), *Bombycia*, Hübn. (type, or), *Tethea*, Hübn. (type, *duplaris*). A. R. Grote, *Bull. Buff. Soc. i.* pp. 276-278.

Acronycta aceris and *hastulifera*, A. & S. Synonymy; *id. l. c. ii.* pp. 154 & 155.

Demas, Steph. Genus re-characterized; *id. l. c. p.* 132.

Leucania extranea, Guén., and *L. propria* and *unica*, Walk., figured by A. G. Butler, *Lep. N. Zealand*, pl. ii. figs. 2, 4, 9. *L. pseudargyria*, Guén.: larva described; F. B. Caulfield, *Canad. Ent. vi.* pp. 132 & 133.

Heliophila phragmitidicola, Guén. Var. n. *texana* described by H. K. Morrison, *l. c. p.* 211.

Senta, Steph. Synonymy discussed; A. R. Grote, *Rep. Peab. Ac. vi.* p. 29.

Nonagria geminipuncta. Transformations; W. Buckler, *Ent. M. M. x.* pp. 230-232. *N. neurica*, larva; *id. l. c. pp.* 275 & 276.

Tapinostola elymi. Habits and true locality noticed by C. G. Barrett, *Tr. Norw. Soc. 1873-74*, Suppl. pp. 31 & 32.

Polytela chrysospila, Walk., figured by Felder, *Reise Novara*, *Lep. iv.* pl. ci. fig. 15.

Eudryas. This genus belongs to the *Noctuae*, and is probably allied to *Miselia* or *Hadena*; H. Strecker, *Lepidoptera*, p. 70. *E. grata*, pp. 88-90; *unio*, pp. 90-94. Transformations described and figured; C. V. Riley, *Rep. Ins. Mo. vi.* *E. brevipennis*, Stretch, is only doubtfully distinct from it.

Apamea, Ochs. (type *nictitans*), and *Gortyna*, Hübn. (type, *micacea*); A. R. Grote, *P. Ac. Philad. 1874*, pp. 205 & 206.

Gortyna flavago. Natural history by Sepp, translated by E. Birchall, *Ent. vii.* pp. 121-125.

Xylophasia vulgaris, G. & R., is a *Hadena*, and has nothing to do with the European *Lithophane socia*; A. R. Grote, *Bull. Buff. Soc. ii.* pp. 197 & 198.

Heliophobus disjungens, Walk., figured by A. G. Butler, *l. c. pl. ii.* fig. 1.

Helotropha reniformis, Grote. A. R. Grote describes var. n. *atra* from St. Catherine's, Canada; P. Ac. Philad. 1874, p. 200.

Crymodes exulis, Lef. F. B. White proposes to call the Scotch form var. *doubledayi*, Scot. Nat. ii. pp. 375 & 376 [but gives no reason for rejecting H. Doubleday's name, *assimilis*].

Mamestra comma, Walk., figured by A. G. Butler, l. c. pl. ii. fig. 6. *M. (Perigrapha, Grote) innexa*, Grote, re-described; H. K. Morrison, P. Bost. Soc. xvii. p. 214. *M. quadrilineata*, Grote, noticed by him; Bull. Buff. Soc. ii. p. 13, note.

Apamea basilinea: injurious to wheat and maize in Galicia; M. Nowicki, Verh. z.-b. Wien, xxiv. pp. 358, 359, 363. *A. gemina*: transformations; W. Buckler, Ent. M. M. x. p. 275. *A. (?) insignata*, Walk., re-described, referred to *Hadena*, and re-named *sputator*, as the specific name is pre-occupied in the latter genus; A. R. Grote, l. c. p. 190. *A. mactata*, Guén.; referred to *Hadena*, and re-described; id. Tr. Am. Ent. Soc. v. p. 91.

Caradrina morpheus. Transformations; W. Buckler, Ent. M. M. x. pp. 254 & 255.

Agrotis. List of species taken by G. Norman, at St. Catherine's, Canada, with dates of captures; A. R. Grote, l. c. p. 90. *A. aquilina*, Hübn., noticed; F. B. White, Scot. Nat. ii. p. 282. *A. cochranii*, Riley, perhaps = *messoria*, Harr.; A. R. Grote, Canad. Ent. vi. p. 214. *A. repentis*, G. & R., = *cochranii*; id. Bull. Buff. Soc. ii. p. 53. *A. comparata*, Möschl., = *imperita*, Hübn.; H. B. Möschler, S. E. Z. xxxv. p. 159. *A. confusa*, Treitschke, is recorded from Anticosti, and re-described; A. R. Grote, Rep. Peab. Ac. vi. p. 25. *A. depressus*, Grote, = *Amphipyra tragopogonis*; H. Strecker, Lepidoptera, p. 93. *A. fæda*, Led.: a variety from Turkestan figured; N. Erschoff, Lep. Turk. p. 40, pl. iii. fig. 48. *A. golickii*, Erschoff, figured and re-described; l. c. p. 41, pl. iv. figs. 39 & 40. *A. islandica*, Staud., re-described from mountains of N. America; A. S. Packard, Hayden's U. S. Survey, 1873, pp. 555 & 556, fig. 10. *A. nullifera*, Walk., figured; A. G. Butler, l. c. pl. ii. fig. 5. *A. occulta*, var. *implicata*, Lef.: larva; J. G. Schilde, S. E. Z. xxxv. p. 66. *A. ortonii*, Pack., = *A. suffusa*, auctt.; H. K. Morrison, P. Bost. Soc. xvii. p. 210. *A. speciosa*, Hübn., and var. *arctica*, Zett.; H. Siebke, S. E. Z. xxxv. p. 63. *A. (Noctua) subrosea*: larva; C. Berg, S. E. Z. xxxv. pp. 146-148 (translated Ent. M. M. xi. pp. 67 & 68. The Russian form is probably distinct; H. Doubleday, l. c. pp. 89 & 90). *A. suffusa*, O., var. *pepoli*, Bert., described and figured in all stages, with an account of its ravages; A. Bertoloni, Bull. Ent. Ital. vi. pp. 139-146, pl. iii. *A. suffusa*, var. *idonea*, Cram., figured by Felder & Rogenhofer, Reise Novara, Lep. iv. pl. cix. fig. 34, from Bogota. *A. wilsoni*, A. R. Grote, re-described; Bull. Buff. Soc. ii. p. 62.

Noctua confusa, Treitschke, does not appear to be distinct from *festiva*, Hübn.; F. B. White, Scot. Nat. ii. pp. 227 & 228. *N. glareosa*, var., G. T. Porritt, Ent. M. M. x. p. 181.

Teniocampa: *Perigrapha picta*, Grote, is referred to this genus, from which *Ceramica* is distinct; H. K. Morrison, Canad. Ent. vi. p. 250. *T. incerta*, Hufn., noticed; A. R. Grote, l. c. ii. p. 23, note. *T. opima*: on

breeding; W. H. Tugwell & G. T. Porritt, Ent. vii. pp. 86, 87, & 110.

Perigrapha semiaperta, H. K. Morrison. Generic characters noticed by Morrison, l. c. p. 150.

Orthosia crasis, H. S. A variety; J. G. Schilde, l. c. p. 68.

Pleonectopoda fimbriaris, Guén., re-described; H. K. Morrison, l. c. p. 134.

Orthodes, Guén., recharacterized and restricted to *O. infirma*, Guén. (re-described, and indicated as type), and *cynica*, Guén. (re-described; *nimia*, Guén., is certainly a synonym, and *candens*, Guén., possibly a variety of this species; *id.* Canad. Ent. vi. pp. 251-253.

Scopelosoma. The American species noticed; A. R. Grote, l. c. i. pp. 191 & 192; ii. pp. 70 & 71; P. Ac. Philad. 1874, p. 209. *Dichogramma vinulenta*, Grote, ? = *S. sidus*, Guén.; *sidus*, Grote ? = *walckeri*, Grote, var.

Cirrhedidia pampina, Guén., has been erroneously referred to *Atethmis*, Hübn., the true type of which is *ambusta*, W. V.; H. K. Morrison, l. c. pp. 259 & 260.

Diantheecia albimacula: transformations, W. Buckler, Ent. M. M. xi. pp. 16-18; larva described, H. Moncreaff, Ent. vii. pp. 130-132. *D. conspersa* and *compta*; C. S. Gregson & E. G. Meek, *op. cit.* pp. 17-19, 19 & 20.

Sericochroa politia, Cram.; ♂ figured by Felder, l. c. pl. xcvii. fig. 21.

Hadena gelata, Lef., = *maillardi*, Gey.; J. G. Schilde, l. c. p. 67. *H. lignana*, Walk., figured by Butler, l. c. pl. ii. fig. 7. *H. rubricosa*, Tr.; J. G. Schilde, l. c. p. 68.

Aletia argillacea, Hübn. (cotton worm, = *Anomis xyliana*, auctt.; *Noctua gossypii*, Fab., probably belongs to a different genus): habits discussed; it appears to migrate annually into the Southern States of the United States from the south, and to die out every season, as it is not indigenous (except possibly in the extreme south), but is a native of Brazil, Mexico, and W. Indies. A. R. Grote, Am. Nat. viii. pp. 562, 722-727. Paris or Scheele's green, which has proved so efficacious in destroying the Colorado potato-beetle, has also been very successful in destroying this insect; C. V. Riley, Rep. Ins. Mo. vi. pp. 17-24.

Auchmis composita, Walk., figured by A. G. Butler; l. c. pl. iii. fig. 12.

Lithophane, Hübn. Synonymy and characters discussed by Grote, and many new species described; Rep. Peab. Ac. vi. pp. 31-35. *L. vulgaris*, G. & R., = *socia*, Hufn.; *L. signosa*, Walk., is re-described; and *cinerea*, Riley (? = *multifascia*, Walk.), noticed.

Calocampa solidaginis. Young larva; J. G. Schilde, l. c. p. 69.

Cucullia. J. A. Lintner figures the following European and N. American species:—*postera*, *asteris*, *asteroides*, *speyeri*, and *intermedia*, pl. i. (♂ & ♀ of each), *lucifuga*, ♂, *absynthii*, ♂, *chamomillæ*, ♂ & ♀, *umbratica*, ♂ & ♀, *convexipennis*, ♂ & ♀, *scrophulariæ*, ♂, and *lichnitiodes*, ♀, pl. ii. Rep. N. Y. S. Mus. xxvi. [These plates are photographic, and only accompany a portion of the impression.]

Omia cyclopes, Grasl., and *Euterpia laudeti*, Boisd., new to France; Miguelle, Pet. Nouv. vi. p. 443 & 444.

Metaponia obtusella, Zell., = *obtusa*, G. & R. ; A. R. Grote, Bull. Buff. Soc. ii. p. 199.

Tarache terminimaculata, Grote, ♀ described; *id. l. c. p. 162*.

Agrophila trabealis, Scop. : var. n. *nigra*, from Turkestan, described and figured by N. Erschoff, *l. c. p. 52*, pl. iii. fig. 50. *A. truncatula*, Zell., = *Erotyla apicella*, G. & R. ; A. R. Grote, *l. c. ii. p. 199*.

Tortricomorpha albifascia and *atro-signata*, Felder, figured by him ; *l. c. pl. cviii. figs. 2 & 3*. Felder now transfers this genus from the *Nycteolidæ* to the *Erastridæ*.

Erastria fuscula. Transformations ; J. Hellins, Ent. M. M. xi. p. 66.

Eustrotia nigrifula, Guén., = *Erastria apicosa*, Steph. ; A. R. Grote, *l. c. ii. p. 199*.

Xanthoptera. H. K. Morrison (*l. c. p. 154*) admits 5 North American species, and refers *X. coccineifascia* and *rosalba* of Grote to *Prothymia*. *X. semicrocea*, Guén. : habits and transformations figured and described ; C. V. Riley, Canad. Ent. vi. pp. 208 & 209, & Am. Nat. viii. pp. 685 & 686.

Thalpochares pallidula, Eversm. & Led., nec H. S., is renamed *griseola*, and figured ; N. Erschoff, *l. c. p. 51*, pl. iv. fig. 55. *T. paula* and *parva* compared ; H. G. Knaggs, Ent. Ann. 1874, pp. 156-158.

Calyptis idonea, Cram. (pl. cccxi. fig. A), re-figured, from Cayenne, by Felder & Rogenhofer, *l. c. pl. cx. fig. 36*.

Plusia bractea occurs in California ; A. R. Grote, *l. c. ii. p. 72*. *P. diasema*, Boisduval : larva, &c. ; J. G. Schilde, *l. c. p. 70*. *P. eriosoma*, Doubl., figured by A. G. Butler, *l. c. pl. iii. figs. 1 & 2*. *P. fratella*, Grote, probably = *ox*, Guén. ; H. K. Morrison, P. Bost. Soc. xvii. p. 219. *P. gamma* occurs in California ; H. Strecker, Lep. p. 94. *P. hohenwarthi*, Hoch. (= *divergens*, F., = *alticola*, Walk., = *igneae*, Grote) ; A. S. Packard, *l. c. pp. 554 & 555*. *P. alticola* and *igneae*, from Colorado, are distinct from the European *hohenwarthi*, which latter is possibly erroneously determined from Labrador by Möschler ; A. R. Grote, *l. c. ii. p. 31*, note. *P. 8-scripta*, Sanborn (*8-signata*, Grote, Canad. Ent. vi. p. 72, *laps. cal.*), re-described ; *id. l. c. p. 72*. *P. putnami*, Grote : amended description ; *id. l. c. i. pp. 192 & 193*. *P. simplex*, Guén., perhaps = *Phalæna omicron*, Linn. The original description, published in 1823, is reproduced ; *id. P. Ac. Philad. 1874*, p. 208.

Gonodonta soror, Cram. : ♀ figured by Felder & Rogenhofer, *l. c. pl. cxi. fig. 13*.

Amphipyra pyramidalis. Transformations popularly described ; W. Saunders, Canad. Ent. vi. pp. 27 & 28.

Orthogonia sera, Feld., figured by Felder & Rogenhofer, *l. c. pl. cxii. fig. 15*.

Catocala. A. R. Grote gives a list of 72 species inhabiting the United States ; Tr. Am. E. Soc. v. pp. 97 & 98 (*cf. also Rep. Peab. Ac. vi. pp. 36 & 37*). *C. faustina* and *meskii* are distinct from *nupta* and *unijuga* respectively ; *aspasia*, Streck., probably = *arizonæ* ; *magdalena*, Streck., = *illecta*, Walk. ; *id. l. c. p. 94* (and Canad. Ent. vi. p. 199). *C. innubens*, var. *flavidalis*, from Illinois, described ; *id. l. c. p. 95*. H. Strecker (Lepidoptera, pl. ix.) figures and re-describes *C. robinsoni* and *retracta*, Grote, figs. 1 & 2 ; *flexibilis*, Grote, figs. 3 & 4, p. 71 ; *marmorata*, Edw.,

and *ultronia*, Hübn., p. 73, figs. 6 & 7; *piatrix*, Grote, and *muliercula*, Guén., p. 74, figs. 8 & 9; *consors*, A. & S., and *nebulosa*, Edw., p. 75, figs. 10 & 11; and *amasia*, A. & S., p. 77, fig. 12, pl. ix.; *C. californica*, Edwards, and *cara*, Guén., figs. 13 & 14; *C. amatriz*, Hübn., figs. 15 & 16, p. 98, pl. xi.; *C. meskii*, Grote, = *unijuga*, Walk., l. c. p. 70; *C. nupta* is said to occur in the United States, p. 99. On collecting; R. Bunker, Canad. Ent. vi. pp. 25 & 26. *C. relictæ* usually alights on a light surface; a dark variety captured on a dark surface; *id.* l. c. p. 100. *C. ultronia*, Hübn.: larva; W. Saunders, *tom. cit.* pp. 147-149. *C. walshi*, Edw., re-described by A. R. Grote, *op. cit.* v. pp. 233 & 234.

Ramphia albizona, Latr. Var. from Demerara figured; Felder & Rogenhofer, l. c. pl. cxiv. fig. 5.

Anisoneura sphingoides, Felder, figured, l. c. pl. cxiii. fig. 1.

Nyctipao crepuscularis and *leucotenina*. Varieties from Celebes described; C. Hopffer, S. E. Z. xxxv. p. 47.

Spirama triloba, Guén., ♀ = *Hypopyra mollis*, Guén.; A. F. Rogenhofer, l. c. pl. cxv. (Erklärung).

Entomogramma faultrix, Guén., from Silhet, figured by Felder & Rogenhofer, l. c. pl. cxv. fig. 5.

Bendis irregularis, Hübn., from Brazil, figured; *id.* l. c. pl. cxix. fig. 16.

Ophiusa crassiuscula, Wood, probably = *Drasteria erectæ*, ♂; A. R. Grote, Bull. Buff. Soc. ii. p. 199.

Remigia impressa, Butler & Druce, figured by A. G. Butler, Lep. Ex. pl. lxi. fig. 19. *R. latipes*, Guén., var. n. *texana* described by H. K. Morrison, l. c. p. 219.

Bolina fasciolaris, Hübn. (= *Ædia nigrescens*, G. & R.), noticed; *id.* l. c. p. 220. The genus should perhaps be united to *Syneda*; *id.* l. c. p. 221.

Focilla epulea, H. S., from the Amazon region and Brazil, figured by Felder & Rogenhofer, l. c. pl. cxviii. fig. 24.

Argidia wedelina, Cram., ♀ figured, from Bogota; *id.* l. c. pl. cviii. fig. 29.

New genera and species.

Dicopsis, A. R. Grote, Rep. Peab. Ac. vi. p. 23. Allied to *Heteromorpha*, Hübn. (= *Diloba*, Boisd.); type, *D. muralis*, sp. n., *ibid.* & Bull. Buff. Soc. ii. pl. i. fig. 1; also *D. thaxterianus*, sp. n., *id.* l. c. ii. p. 196, Massachusetts.

Eutolype, *id.* P. Ac. Philad. 1874, p. 198. Allied to *Dicopsis*; type, *E. rolandi*, sp. n., *ibid.* Massachusetts, Missouri.

Feralia, *id.* Bull. Buff. Soc. ii. p. 58. Allied to *Diphthera*; types, *D. jocosa*, Guén. (re-described), and *F. constocki*, Ithaca, N. Y., and *februalis*, Sanzalito, spp. nn., l. c. pp. 59 & 60.

Amphitape, A. F. Rogenhofer, Reise Novara, Lep. iv. pl. cix. (Erklärung). Allied to *Leucania*; type, *A. crassitibia*, Felder & Rogenhofer, l. c. fig. 10, New Zealand.

Macronoctua, A. R. Grote, Rep. Peab. Ac. vi. p. 27. Allied to *Nongria*; type, *M. onusta*, sp. n., *ibid.* Illinois.

Amolita, id. Bull. Buff. Soc. ii. p. 158. Allied to *Senta*; type, *A. fessa*, sp. n., *ibid.*, New York.

Platysenta, id. Rep. Peab. Ac. vi. p. 28. Allied to *Senta*; type, *P. atriciliata*, sp. n., *ibid.* and Bull. Buff. Soc. ii. pl. i. fig. 2, Middle States.

Eucloptocnemis, id. Bull. Buff. Soc. ii. p. 13. Type, *Heliophobus fimbriaris*, Guén.

Ledereria, id. l. c. pp. 54, 109, note (*Luperina*, group B, Led.).

Himella, id. P. Ac. Philad. 1874, p. 200. Allied to *Caradrina*; types, *H. fidelis* and *furfurata*, p. 201, Albany, spp. nn.

Tornos, H. K. Morrison, P. Bost. Soc. xvii. p. 217. Allied to *Caradrina*; type, *T. robiginosus* [sic], sp. n., l. c. p. 218, Waco, Texas.

Zosteropoda, A. R. Grote, Bull. Buff. Soc. ii. p. 67. Allied to *Heliophila*; type, *Z. hirtipes*, sp. n., l. c. p. 68, California.

Anciola, id. l. c. p. 159. Allied to *Agrotis*; type, *A. alabamæ*, sp. n., *ibid.*, Central Alabama.

Adita, id. l. c. p. 63. Between *Agrotis* and *Mamestra*; type, *Phalæna chionanthi*, A. & S. (re-described).

Thaumatoopsis, H. K. Morrison, l. c. p. 161. Allied to *Doryodes* and *Sudariophora*; type, *T. longipalpis*, sp. n., *ibid.*, St. Louis.

Pseudorthosia, A. R. Grote, l. c. p. 161. Type, *P. variabilis*, sp. n., *ibid.*, Sanzálito; also *P. pectinata*, sp. n., id. P. Ac. Philad. 1874, p. 207, Colorado, Texas.

Pseudorthodes, H. K. Morrison, Canad. Ent. vi. p. 253. Type, *Orthodes vecors*, Guén. (re-described, p. 254), of which *O. griseo-cincta*, Harvey, is a variety.

Zotheca, A. R. Grote, Bull. Buff. Soc. ii. p. 68. Allied to *Calymnia* and *Enargia*; type, *Z. tranquilla*, sp. n., l. c. p. 69, California.

Teniosea, id. l. c. p. 143. Allied to *Teniocampa*; types, *T. gentilis*, *ibid.*, and *perbellis*, p. 144, St. Catherine's, Ontario, spp. nn.

Matuta, id. Canad. Ent. vi. p. 116. Allied to *Teniocampa*; type, *M. catherina*, sp. n., *ibid.*, St. Catherine's.

Copipanolis, id. Rep. Peab. Ac. vi. p. 25. Allied to *Panolis*, &c.; type *C. cubilis*, sp. n., *ibid.* & Bull. Buff. Soc. ii. pl. i. fig. 6, Michigan and New England; also *C. vernalis*, sp. n., H. K. Morrison, l. c. p. 133, Massachusetts.

Pachypolia, A. R. Grote, Rep. Peab. Ac. vi. p. 27. Allied to *Polia*; type, *P. atricornis*, sp. n., *ibid.*, Wisconsin.

Conservula, id. Bull. Buff. Soc. ii. p. 17; type, *Phlogophora anodonta*, Guén.

Homohadena [cf. Zool. Rec. x. p. 398], id. Tr. Am. Ent. Soc. v. p. 92. Type, *H. kappa*, sp. n., *ibid.*, Kansas, California; also *H. retroversa*, sp. n., H. K. Morrison, l. c., p. 157, Central Missouri.

Chytonix, A. R. Grote, Bull. Buff. Soc. ii. p. 66. Allied to *Homohadena*; type, *C. iaspis*, sp. n., *ibid.*, Ithaca, N. York.

Morrisonia, id. l. c. p. 53. Allied to *Actinotia*; types, *Chloantha evicta* and *vomerina*, Grote; also *M. peracuta*, sp. n., H. K. Morrison, *tom. cit.* p. 114, Texas or California.

Melaporphyria, A. R. Grote, l. c. p. 75. Allied to *Melicleptria*; type, *M. immortua*, sp. n., *ibid.*, Albany and Cambridge, U.S.

Stiria, A. R. Grote, *l. c.* p. 73. Allied to *Plagiomimicus*; type, *S. rugifrons*, sp. n., *ibid.*, Kansas, Colorado.

Stibadium, *id. l. c.* p. 74. Allied to last; type, *S. spumosum*, sp. n., *ibid.*, Kansas.

Tricopsis, *id. l. c.* p. 75. Allied to *Tarache*; type, *T. chrysellus*, sp. n., *l. c.* p. 76, pl. i. fig. 10, Texas.

Pteroscia, H. K. Morrison, P. Bost. Soc. xvii. p. 155. Allied to *Eccrita*, Led., and *Toxocampa*, Guén.; type, *P. atrata*, sp. n., *l. c.* p. 156, Mount Washington.

Leucobrephos, A. R. Grote, *l. c.* p. 53. Allied to *Brephos*; type, *Anarta brephoides*, Walk.

Acerra, *id. l. c.* p. 162. Allied to *Plusia*; type, *A. normalis*, sp. n., *ibid.*, California.

Abolla, A. F. Rogenhofer. Allied to *Plusia*?; type, *A. pallicosta*, sp. n., Felder & Rogenhofer, Reise Novara, Lep. iv. pl. cxi. fig. 5, S. America.

Homopyralis, A. R. Grote, P. Ac. Philad. 1874, p. 213. Allied to *Homoptera*; types, *H. tactus*, United States, and *tantillus*, Southern States, spp. nn., *l. c.* pp. 213 & 214.

Dysedia, A. F. Rogenhofer. Allied to *Anophia*; type, *D. zibellina*, sp. n., Felder & Rogenhofer, *l. c.* pl. cxii. fig. 8, Sarawak.

Pseudanthracia, A. R. Grote, Bull. Buff. Soc. ii. p. 46. Type, *Anthracia coracias*, Guén.

Agonista (= *Lygniodes*, Guén., preoccupied by *Diptera*), A. F. Rogenhofer, *l. c.* pl. cxiii. (Erklärung).

Catamelas, A. F. Rogenhofer. Allied to *Nymbis*; type, *C. caripina*, sp. n., Felder & Rogenhofer, *l. c.* pl. cxix. fig. 21, Amazon region.

Thyatira casta, Felder, *l. c.* pl. xcviii. fig. 8, hab. ?

Cymatophora improvisa, H. Edwards, P. Cal. Ac. v. p. 189, Washington Territory.

Charadra dispulsa, H. K. Morrison, P. Bost. Soc. xvii. p. 213, Waco, Texas.

Bryophila leucorrhiza, *iridescens*, and *velutina*, Felder, *l. c.* pl. c. figs. 12-14, hab. ?; *B. galathea* (? = *perlodes*, var.), Alpes Maritimes, and *oxybiensis*, Cannes, P. Millière, R. Z. (3) ii. pp. 241 & 242; *B. perrara*, H. K. Morrison, *l. c.* p. 213, Waco, Texas.

Dylomia (g. n. ?) *tortricina*, *casia*, and *ciliata*, pl. xcvii. figs. 13-15, and *diagonalis*, pl. xcviii. fig. 5, Felder, *l. c.*, hab. ?

Toxoloma (g. n. ?) *australe*, *id. l. c.* pl. c. fig. 16, hab. ?

Scolopocneme (g. n. ?) *cerussata*, *id. l. c.* pl. c. fig. 11, hab. ?

Galleriomorpha (g. n.) *lichenoides* [Nietner, MS.], *id. l. c.* pl. c. fig. 15 [Ceylon: feeds on coffee-plant, cf. Zool. Rec. ii. p. 616.]

Jaspidea lepidula, A. R. Grote, Rep. Peab. Ac. vi. p. 23, & Bull. Buff. Soc. ii. pl. i. fig. 3, United States.

Demas diversicolor, H. K. Morrison, *l. c.* p. 132, New York, Massachusetts.

Acronycta paragrapha, *lichenosa*, and *canina*, pl. c. figs. 8-10, hab. ?; *hercules*, pl. cix. fig. 2, Japan, Felder & Rogenhofer, *l. c.*; *A. centralis*, N. Erschoff, Lep. Turk. p. 37, pl. iii. fig. 35, Turkestan and Samarcand;

A. subochrea, St. Catherine's, New York, and *quadrata*, Kansas, A. R. Grote, Bull. Buff. Soc. ii. pp. 153 & 154; *A. perditæ*, id. Canad. Ent. vi. p. 154, California; *A. exilis*, New York, and *pauperata*, Texas, id. P. Ac. Philad. 1874, p. 197; *A. dactylina*, Quebec and New York, *albarufa*, Missouri, p. 239, *lithospila*, New York, p. 240, id. P. Bost. Soc. xvi.; *A. increta* and *aspera*, H. K. Morrison, *op. cit.* xvii. pp. 131 & 132, New York.

Leucania cicatrix, Venezuela, Brazil, and *nareda*, N. India, figs. 8 & 9, *lindigi*, Bogotá, and *tangala*, Ceylon, figs. 11 & 12, pl. cix., *tacuna*, pl. cx. fig. 22, Caffraria, Felder & Rogenhofer, l. c.; *L. bogdanovi*, N. Erschoff, l. c. p. 45, pl. iv. fig. 54, Khokand; *L. harveyi* (? = *albilinea*, Guén., nec Hübn.), p. 9, fig. 14, Buffalo, *henrici* and *evanida*, p. 10, figs. 15 & 16, New York State, A. R. Grote, Bull. Buff. Soc. ii. pl. i.

Heliothila adjuncta, Alabama, and *adonea*, Ithaca, New York, id. l. c. pp. 158 & 159.

Senta defecta, id. Rep. Peab. Ac. vi. p. 29, and Bull. Buff. Soc. ii. pl. i. fig. 4, Eastern States.

Hydræcia semiaperta, H. K. Morrison, Canad. Ent. vi. p. 105, Massachusetts, New York.

Gortyna cerma, A. R. Grote, P. Ac. Philad. 1874, p. 200, Kansas.

Trichotis (g. n. ?) *picta*, Felder, l. c. p. xcvii. fig. 19, hab. ?

Ichthyosoma (g. n. ?) *ligniferum*, id. l. c. fig. 17, hab. ?

Nycterotis (g. n. ?) *pæcila*, id. l. c. fig. 20, hab. ?

Xylomiges hiemalis, A. R. Grote, Bull. Buff. Soc. ii. p. 71, California.

Trigonophora speyeri, Felder & Rogenhofer, l. c. pl. cx. figs. 2 & 5, S. Africa.

Luperina angasi, Felder & Rogenhofer, l. c. pl. cix. fig. 26, Australia;

L. reniformis, A. R. Grote, Canad. Ent. vi. p. 14, Canada and New York (referred to *Helotropha*, id. Bull. Buff. Soc. ii. p. 18).

Psilocron (g. n. ?) *luteovirens*, Felder, l. c. pl. xcvii. fig. 22, hab. ?

Mamestra siri, p. 41, pl. iii. fig. 42, and *irrisor*, p. 42, pl. iv. fig. 53, N. Erschoff, l. c. Turkestan; *M. sphaguca*, *augusta*, and *acceptrix*, figs. 17-19, *griseipennis*, *antipoda*, and *maori*, figs. 22-24, all from New Zealand, *M.* (E. v. = *Dargida*, Walk.) *crucifer*, Luzon, fig. 30, *M. stoliczkae*, Himalaya, fig. 32, pl. cix., *bulgeri*, S. Africa, pl. cx. fig. 18, Felder & Rogenhofer, l. c.; *M. claviplena*, A. R. Grote, Bull. Buff. Soc. i. p. 194, Albany, *puerilis*, p. 64, Mendocino, and *vicina*, p. 156, St. Catherine's and Massachusetts, id. l. c. ii.; *M. cinnabarina*, id. P. Bost. Soc. xvi. p. 241, California; *M. passa*, p. 139, California, *impolita*, p. 140, Quebec, *illabefacta*, p. 141, Massachusetts, *olivacea*, p. 143, New York and New Hampshire, and *incincta*, p. 156, Illinois, H. K. Morrison, *op. cit.* xvii.; *M. assimilis*, id. Bull. Buff. Soc. ii. p. 113, Massachusetts; *M. rosea*, Maine, and *lilacina*, Brewster, New York, L. F. Harvey, *op. cit.* p. 118.

Apamea connivens, Felder & Rogenhofer, l. c. pl. cix. fig. 27, Natal; *A. purpuripennis*, A. R. Grote, P. Ac. Philad. 1874, p. 206, Newtownville, Massachusetts.

Perigea luxa, id. Bull. Buff. Soc. ii. p. 200, note, United States.

Caradrina huegeli, Natal, Bengal, and *pallicornis*, S. Africa, Felder & Rogenhofer, l. c. pl. cix. figs. 13 & 20; *C. miranda*, A. R. Grote, l. c. 1874. [VOL. XI.]

p. 11, New York State; *C. disticha*, H. K. Morrison, P. Bost. Soc. xvii. p. 217, Waco, Texas.

Agrotis nomas, p. 38, fig. 36, *scripturosa*, p. 39, fig. 37, and *solida*, p. 40, fig. 41, all from Khokand, N. Erschoff, l. c. pl. iii.; *A. polygonides*, O. Staudinger, S. E. Z. xxxv. p. 94, N. E. Caucasus; *A. erdmanni*, H. B. Möschler, *op. cit.* p. 158, Labrador; *A. (?) hyblæa*, pl. cviii. fig. 43, Himalaya, *A. (Turma, Led., F. B.) acetina*, New Zealand, fig. 6, and *A. pennicillum*, fig. 33, Guatemala, pl. cix., *baueri*, Australia, *nivalis*, Cape, *ferina*, S. Africa, *scapularis*, Australia, figs. 10-13, *A. (?) scotti*, Australia, *A. decipiens*, S. Africa, figs. 16 & 17, *A. (E. b. 2) nipona*, Japan, and *antipoda*, Australia, figs. 20 & 21, pl. cx., Felder & Rogenhofer, l. c.; *A. saxigena*, White Mountains, *claviformis*, Massachusetts, *decolor*, Northern States, *gladiaria*, Massachusetts, p. 162, *stigmosa*, Massachusetts, New York, *plagigera*, Colorado, *bochus*, Nebraska, *permunda*, Massachusetts, Canada, *tenuicula*, New York, p. 163, *cinereomacula*, St. Louis, *simplicius* (corrected to *simplaria*, p. 210), Texas, *intrita* and *perpura*, California, *incivis*, California, Missouri, and Florida, p. 164, *monochromatea*, Massachusetts, *redimacula*, Colorado, Albany, Massachusetts, *rufipectus*, New York, *scropulana* [*sic*] and *opipara*, Mount Washington, p. 165, *unimacula*, Atlantic States, *exsertistigma*, California, *rileyana*, St. Louis, *manifestolabes* [!], Massachusetts, p. 166, *morrisoniana* and *teligera*, pp. 214 & 215, Waco, Texas, H. K. Morrison, P. Bost. Soc. xvii.; *A. normannianus*, A. R. Grote, Tr. Am. Ent. Soc. v. p. 89, Canada and United States; *A. badinodis*, Maryland, p. 13, *attentus* [-*ta*], Maine, and *perattentus* [-*ta*], Massachusetts, p. 131, *fuscigerus* [-*ra*], and *hollemanii*, California, pp. 155 & 156, *id.* Canad. Ent. vi.; *A. phyllophora*, New York and Canada, p. 61, *formalis* and *specialis*, pp. 61 & 62, California, *gravis*, p. 155, Mendocino, *id.* Bull. Buff. Soc. ii.; *A. innotabilis* and *euroides*, California, p. 202, *bostoniensis*, Massachusetts, *id.* P. Ac. Philad. 1874, p. 203; *A. gilvipennis*, Anticosti, and *velleripennis*, New York, *id.* Rep. Peab. Ac. vi. pp. 24 & 25; *A. tricola*, J. A. Lintner, Rep. N. York Mus. xxvi. p. 159 (= *A. jaculifera*, var. a, Guén.); *A. volubilis*, L. F. Harvey, Bull. Buff. Soc. ii. p. 118, New York State.

Segetia fidicularia, New York, *fabrefacta*, Nantucket, Brooklyn, pp. 145 & 146, *orbica*, p. 216, Waco, Texas; H. K. Morrison, l. c.

Brotis (?) stenogaster, Felder & Rogenhofer, l. c. pl. cxix. fig. 5, Cayenne.

Pachnobia cornuta, A. R. Grote, Bull. Buff. Soc. ii. p. 68, California; *P. (?) australiæ*, Felder & Rogenhofer, l. c. pl. cxi. fig. 27, Australia.

Ceramica rubefacta, H. K. Morrison, Canad. Ent. vi. p. 249, Massachusetts.

Teniocampa pavie (Behr, MS.), H. Strecker, Lepidoptera, p. 94, California; *T. pacifica*, L. F. Harvey, l. c. p. 120, Sanzálito; *T. capsella*, A. R. Grote, P. Ac. Philad. 1874, p. 201, Albany; *T. modifica*, p. 150, Massachusetts, *earina*, p. 158, California, *confluens*, p. 159, St. Louis, *intractata*, p. 160, Missouri, H. K. Morrison, P. Bost. Soc. xvii.

Xenochroa (g. n. ?) *notodontina*, Felder, l. c. pl. xcvi. fig. 23, hab. ?

Perigrapha lunexa, A. R. Grote, l. c. p. 123, note, Texas; *P. normani*, *id.* Canad. Ent. vi. p. 115, St. Catherine's, Canada.

Orthosia purpurea, p. 125, note, California, *infumata*, p. 160, Chantousque Co., New York, A. R. Grote, *l. c.*; *O. viatica*, p. 29, United States, *decliva*, and *apiata*, Chicago, and *inulta*, United States, p. 30, *id.* Rep. Peab. Ac. vi. (*O. apiata* and *inulta* figured, Bull. Buff. Soc. ii. pl. i. figs. 8 & 9); *O. minuscula*, p. 147, Tuckernuck Island, Nantucket, *baliola*, p. 148, Massachusetts, *belangeri*, p. 149, Quebec, H. K. Morrison, *l. c.*

Orthodes griseo-cincta, L. F. Harvey, *l. c.* p. 120, Pennsylvania.

Glea olivata, *id.* *l. c.* p. 120, California; *G. sericea*, Boston, Massachusetts, p. 150, *pastillicans*, New Hampshire, p. 151, H. K. Morrison, *l. c.*

Scopelosoma grueffiana [-num], New York, and *ceromatica* [-cum], New Jersey, A. R. Grote, Bull. Buff. Soc. ii. pp. 69 & 70; *S. devia* [-ium], *id.* P. Ac. Philad. 1874, p. 209; *S. napæa* [-æum], H. K. Morrison, *l. c.* p. 152, Massachusetts.

Pyrophila glabella, *id.* *l. c.* p. 153, Nebraska.

Xanthia minor, Felder & Rogenhofer, *l. c.* pl. cix. fig. 3, hab. ?

Cirrædia (?) *areola*, *iid.* *l. c.* pl. cviii. fig. 22, Cape of Good Hope.

Platenis (?) *marginæa* and *leprosa*, Cape of Good Hope, *scapularis*, S. Africa, *id.* *l. c.* pl. cxi. figs. 8-10.

Ipinorpha pleonectura, A. R. Grote, Bull. Buff. Soc. i. p. 191, New York.

Dischorista indecisa, Felder & Rogenhofer, *l. c.* pl. cx. fig. 1, Cape of Good Hope.

Calymnia virens and *oryx*, *iid.* *l. c.* pl. cix. figs. 5 & 35, Venezuela.

Cosmia sambuci (Behr, MS.), H. Strecker, Lepidoptera, p. 94, California; *C.* (?) *sundana*, Felder & Rogenhofer, *l. c.* pl. cx. fig. 38, Amboina.

Dianthæcia æramen and *botonga*, S. Africa, Felder & Rogenhofer, *l. c.* pl. cix. figs. 15 & 28; *D. rufula* and *insolens*, A. R. Grote, *l. c.* ii. pp. 64 & 65, California; *D. pensilis*, *id.* P. Ac. Philad. 1874, p. 199, Victoria, Vancouver's Island; *D. modesta*, H. K. Morrison, *l. c.* p. 144, Cambridge, Massachusetts.

Oncocnemis behrensi, A. R. Grote, *l. c.* p. 65, Sanzalito.

Polia leucoscelsis, A. R. Grote, Rep. Peab. Ac. vi. p. 26, Wisconsin; *P. perquiritata*, p. 136, White Mountains, *speciosa*, p. 137, Cambridge, Massachusetts, *confragosa*, p. 138, Quebec, H. K. Morrison, *l. c.*

Euplexia augeus and *saldanha*, Knysna, *roseola*, Venezuela, and *amaranta*, Natal, Felder & Rogenhofer, *l. c.* pl. cx. figs. 5-8; *E. cuprea*, Moore, P. Z. S. 1874, p. 578, Simla.

Polyphænis frauenfeldi, Felder & Rogenhofer, *l. c.* pl. cix. fig. 14, Rio Janeiro.

Eurois presens, A. R. Grote, Trans. Am. Ent. Soc. v. p. 90, New York, St. Catherine's, Canada; *E. stricta*, H. K. Morrison, *l. c.* p. 135, New Hampshire.

Prinoptera (?) *ampliata*, Felder & Rogenhofer, *l. c.* pl. cxvii. fig. 27, Amazon.

Orthosoma (g. n. ?) *diffusum*, Felder, *l. c.* pl. xcvi. fig. 18, hab. ?

Hadena abida, Brazil, *lucia* and *algoa*, S. Africa *adducta*, Venezuela,

H. (?) leucosoma, Natal, pl. cix. figs. 7, 16, 21, 25 & 31; *H. (Turma, B) taprobanae*, Ceylon, *H. (Turma, C, Led.; Miana, Steph.) aduncula*, hab. ?, *H. pallirena*, Venezuela, Brazil, pl. cx. figs. 3, 4 & 9, Felder & Rogenhofer, l. c.; *H. flava*, p. 91, British Columbia, Colorado, *delicata*, p. 92, Illinois, A. R. Grote, Tr. Am. Ent. Soc.; *H. genialis* and *marina*, pp. 66 & 67; California, *confederata*, p. 143, New Orleans, Texas, *castanea*, p. 156, *albina* and *curvata*, p. 157, California, *id.* Bull. Buff. Soc. ii.; *H. fractilinea*, p. 15, Canada, Albany, *divesta*, p. 215, California, *id.* Canad. Ent. vi.; *H. (section Oligia, Hübner, re-characterized) versicolor*, St. Catherine's, and *H. (O.) tracta*, Texas, *id.* P. Ac. Philad. 1874, p. 204; *H. vulgivaga*, p. 144, Nebraska, New York, *rasilis*, p. 158, St. Louis, *relicina*, p. 216, Waco, Texas, H. K. Morrison, P. Bost. Soc. xvii.; *H. congermana*, *id.* Canad. Ent. vi. p. 106, St. Catherine's.

Dryobota californica (Behr, MS.), H. Strecker, Lepidoptera, p. 94, California; *D. fibulata*, H. K. Morrison, Bull. Buff. Soc. ii. p. 112, Quebec; *D. agnata*, Felder & Rogenhofer, l. c. pl. cix. fig. 4, Brazil.

Calocampa nupera, J. A. Lintner, Bull. Buff. Soc. ii. p. 188 (*cf.* also H. K. Morrison, *op. cit.* pp. 190 & 191), United States; *C. curvimacula*, Cambridge, Massachusetts, and *germana*, Adirondack Mountains, H. K. Morrison, l. c. pp. 191 & 192; *C. cineritis*, A. R. Grote, P. Ac. Philad. 1874, p. 210, Newtownville, Massachusetts.

Lithophane laticinerea, New York, Wisconsin, *tepida*, Massachusetts, p. 27, note, *oriunda*, p. 160, Canada, and *thaxteri*, p. 196, Massachusetts, A. R. Grote, Bull. Buff. Soc. ii.; *L. petulca*, p. 31, Quebec, *ferrealis*, p. 32, Buffalo, *semiusta*, Canada, and *querquera* (figured, Bull. Buff. Soc. ii. pl. i. fig. 5), p. 34, and *pexata*, p. 35, Pennsylvania, *id.* Rep. Peab. Ac. vi., *L. fagina*, Massachusetts, and *disposita*, Canada and Northern States, H. K. Morrison, Bull. Buff. Soc. ii. pp. 115 & 116.

Magusa dissidens and *sarpida*, Felder & Rogenhofer, l. c. pl. cviii. figs. 50 & 51, Bogotá.

Nystalea grammodes, figs. 1 & 2, *bractea*, *plusioides*, *longicornis*, *cucullia*, *plusia*, *aurora*, and *thermesia*, figs. 3-9, pl. xcvii., *marcida* and *virgula*, pl. xcvi. figs. 2 & 3, *id.* l. c.

Cucullia solidaginis and *matricariae*, H. Strecker, Lepidoptera, p. 94, California; *C. consimilis*, *terensis*, and *pallidistria*, Felder & Rogenhofer, l. c. pl. cviii. figs. 52-54, S. Africa; *C. speyeri*, pp. 168-174, figs. 13 & 14, and pl. i., Philadelphia, and *serraticornis*, pp. 174-176, California, J. A. Lintner, l. c.

Lobogona (g. n. ?) *hapygia*, Felder, l. c. pl. xcvi. fig. 4, hab. ?

Epimecia abunda, Cape of Good Hope, and *E. (?) enigma*, Natal, Felder & Rogenhofer, l. c. pl. cviii.

Calophasia christophi, N. Erschoff, l. c. p. 46, pl. iii. fig. 44, Kisil-kum.

Mycteropus didymogramma, *id.* l. c. p. 44, pl. iii. fig. 43, Kisil-kum.

Aspila tergemina, Felder & Rogenhofer, l. c. pl. cviii. fig. 55, Venezuela.

Schinia rectifascia, A. R. Grote, P. Bost. Soc. xvi. p. 242, Pennsylvania, Alabama.

Alaria volupia, Fitch, Trans. N. York Agric. Soc. 1868, p. 900, Indian Territory.

Tamila tertia, A. R. Grote, P. Ac. Philad. 1874, p. 212, Texas.

Pseudolimacodes (g. n.) *niveicostatus*, id. l. c. p. 212, hab. ?

Heliothis delicia, Amboina, Siam, *conchula*, Texas, and *acesias*, hab. ?, Felder & Rogenhofer, l. c. pl. cviii. figs. 40-42; *H. jugorum*, p. 48, fig. 46, Khokand, *feildi*, p. 49, fig. 45, Bairuk, N. Erschoff, l. c. pl. iii.; *H. (Meliocleptria) pulchripennis*, A. R. Grote, P. Bost. Soc. xvi. p. 241, California.

Heliochilus translucens, Felder & Rogenhofer, l. c. pl. cviii. fig. 49, Himalaya.

Pyrrhia angulata, A. R. Grote, Tr. Am. Ent. Soc. v. p. 93, Buffalo; *P. illiterata*, id. P. Ac. Philad. 1874, p. 211, Illinois, Massachusetts.

Anarta ladakensis, Felder & Rogenhofer, l. c. pl. cviii. fig. 38, Himalaya; *A. quadrilunata* and *subfuscata*, A. R. Grote, P. Bost. Soc. xvi. p. 244 (*subfuscata* figured, Bull. Buff. Soc. ii. pl. i. fig. 7), Colorado.

Ariola ransonneti, Felder & Rogenhofer, l. c. pl. cviii. fig. 1, Ceylon.

Metoponia subflava and *ochracea*, N. Erschoff, l. c. pp. 52 & 53, pl. iii. figs. 51 & 52, Kisil-kum.

Xanthodes adunco, Felder & Rogenhofer, l. c. pl. cviii. fig. 39, hab. ?

Euphasia (?) *cliens*, iid. l. c. fig. 48, hab. ?

Acontia inda, *acerba* and *scanda*, figs. 23, 25 & 27, Bengal, *acclivis*, *madanda*, *admota*, *komaga*, and *umbrigeri*, figs. 24, 28, 31, 33 & 34, S. Africa, *guttifera*, *unio*, and *urbani*, figs. 26, 32 & 35, Natal, *bilimeki*, fig. 29, Mexico, and *redita*, hab. ?, fig. 30, Felder & Rogenhofer, l. c. pl. cviii.; *A. hueberi*, N. Erschoff, l. c. p. 49, pl. iii. fig. 47, Kisil-kum.

Tortricomorpha flaviceps, Himalaya, and *costipuncta*, Amboina, Felder & Rogenhofer, l. c. pl. cviii. figs. 4 & 5.

Erastria africana and *E. (?) bavia*, figs. 6 & 37, Natal, *bogotana*, New Granada, fig. 21, pl. cviii., *E. (?) nyanza*, pl. cxix. fig. 6, S. Africa, Felder & Rogenhofer, l. c.; *E. quadrifera*, P. C. Zeller, Verh. z.-b. Wien, xxiv. p. 425, pl. xii. fig. 2, Mazatlan.

Xanthoptera nigrocaput [!], H. K. Morrison, P. Bost. Soc. xvii. p. 153, Texas.

Eustrotia obaurata, id. l. c. p. 154, Massachusetts.

Phothedes kisilkumensis and *secunda*, N. Erschoff, l. c. pp. 51 & 52, pl. iii. figs. 48 & 49, Kisil-kum.

Thalpochares accedens and *adulans*, Java, figs. 8 & 11, *sperans*, T. (?) *griseola*, T. *delicata* and *sabia*, Cape of Good Hope, figs. 9, 10, 13, & 16, *pennula*, T. (?) *squamilinea*, T. *sacraria*, *ornatula*, and *ærugo*, figs. 12, 14, 17, 19, & 45, S. Africa, *accineta*, fig. 15, Amazon region, and *novaræ*, Rio Janeiro, fig. 18, pl. cviii., *striga*, pl. cix. fig. 29, Himalayas, Felder & Rogenhofer, l. c.

Lygranthæcia saturata, A. R. Grote, Bull. Buff. Soc. ii. p. 74, Texas.

Metoptria absita, Felder & Rogenhofer, l. c. pl. cviii. fig. 36, Cape.

Palindia albata, *guttata*, and *fumata*, figs. 1, 3, & 17, Amazon region, *corineta*, fig. 2, Amazon region, Brazil, *testaceiceps*, fig. 16, America, *crocoptera*, fig. 18, Cayenne, Felder & Rogenhofer, l. c. pl. cxi.

Dyops pupillata (? = *ocellata*, Cram., pl. cclxxvi. E, nec D), Felder & Rogenhofer, l. c. pl. cxi. fig. 21, Surinam.

Eriopus doleschalli and *wallacii*, figs. 14 & 26, Amboina, *decumana*, fig. 25, Brazil, iid. l. c. pl. cx.

- Phlegetonia* (?) *bellona*, Felder & Rogenhofer, *l. c.* pl. cxii. fig. 1, Cayenne.
Penicillaria nattereri, iid. *l. c.* pl. cx. fig. 19, Brazil.
Eurhipia geyeri, Japan, and *bowkeri*, Caffraria, pl. cx. figs. 23 & 29, *prætexta*, pl. cxi. fig. 24, Ceylon, iid. *l. c.*
Dysodita (= *Varnia*, Walk.) *thyridina*, iid. *l. c.* pl. cxvii. fig. 20, Cayenne.
Diastenia (?) *multigutta*, iid. *l. c.* pl. cxix. fig. 20, Amazon region.
Plusia echinocystidis (Behr, MS.), H. Strecker, Lepidoptera, p. 94, California; *P. contexta*, New York, and *striatella*, United States, A. R. Grote, Bull. Buff. Soc. i. pp. 193 & 194; *P. viridisigma*, Quebec, p. 73, *fratella*, Texas, p. 161, *id. l. c.* ii.; *P. labrosa*, California, and *epigea*, New York, *id. P. Ac. Philad.* 1874, pp. 207 & 208; *P. kalitura*, Ceylon, *wahlbergi*, Natal, *exquisita*, Cape, *sestertia*, S. Africa, *agens*, Bengal, *dorfmeisteri* and *ablusa*, S. Africa, and *adrasta*, Celebes, Felder & Rogenhofer, *l. c.* pl. cx. figs. 24, 27, 30-35.
Thyria fulgida, Felder & Rogenhofer, *l. c.* pl. cx. fig. 37, Cayenne.
Plusiodonta nummeria, iid. *l. c.* pl. cxi. fig. 6, Cape.
Oræsia nobilis, iid. *l. c.* pl. cxi. fig. 7, Amazon region.
Gonodonta dentata, Amazon region, and *fulvidens*, Cayenne, iid. *l. c.* pl. cxi. figs. 4 & 14.
Platyodonta (g. n. ?) *calpe*, Felder, *l. c.* pl. xcvi. fig. 16, hab. ?
Canodia (?) *camora*, Felder & Rogenhofer, *l. c.* pl. cxi. fig. 20, Amazon.
Arcyophora zanderi, iid. *l. c.* pl. cxi. fig. 15, Abyssinia.
Hemiceras plusiata and *nystalina*, Felder, *l. c.* pl. xcvi. figs. 11 & 12, hab. ?
Plusiodes (?) *rufipes*, Felder & Rogenhofer, *l. c.* pl. cx. fig. 28, Bogotá.
Achantodes (?) *atava*, iid. *l. c.* pl. cxix. fig. 4, S. Africa.
Hyblæa tenebrionis, Java, Silhet, and *amboina*, Amboina, iid. *l. c.* pl. cxi. figs. 11 & 12.
Amphipyra (?) *cinctipes*, fig. 19, Australia, *A. (?) laportii*, fig. 28, Amboina or Ceram, pl. cxi., *A. surnia*, Japan, and *chalconera*, Himalaya, pl. cxii. figs. 17 & 18, iid. *l. c.*
Mania (?) *cladonia*, iid. *l. c.* pl. cxv. fig. 4, Cayenne.
Ophitis (g. n. ?) *magnaria*, Felder, *l. c.* pl. xcvi. fig. 10, hab. ?
Spintherops glebicolor, N. Erschoff, *l. c.* p. 58, pl. iv. fig. 59, Khokand; *S. gracilis*, O. Staudinger, S. E. Z. xxxv. p. 95, Krasnosowodsk; *S. accipiter*, pl. cxi. fig. 29, Pangi, *S. (?) undulata*, pl. cxvii. fig. 22, Java, Felder & Rogenhofer, *l. c.*
Tarache tenuicula, H. K. Morrison, P. Bost. Soc., xvii. p. 218, Waco, Texas.
Toxocampa victoria, A. R. Grote, Bull. Buff. Soc. ii. p. 163, Victoria, Vancouver's Island.
Pandesma (?) *sublineis* and *P. hemodi*, Himalayas, *sennaarensis* [-se], Africa, Felder & Rogenhofer, *l. c.* pl. cxi. figs. 23, 25 & 26.
Polydesma mastrucata [-tum], iid. *l. c.* pl. cxi. fig. 31, N. India.
Diatenes (?) *lawsoni*, iid. *l. c.* pl. cxi. fig. 30, Australia.
Alamis meleagris, iid. *l. c.* pl. cxi. fig. 32, Ceylon.
Homoptera scandatula, iid. *l. c.* pl. cxi. fig. 22, Natal.
Vrias tachypetes, iid. *l. c.* pl. cxii. fig. 2, Amazon region.

- Lepidodes cornifrons*, iid. l. c. pl. cxii. fig. 11, Venezuela.
Cenipeta feronia, iid. l. c. pl. cxii. fig. 7, Amazon region.
Hypogramma athena and *hemiplagia*, S. America, *iochroma*, Amazon region, *pectorosa* [-sum] and *cholericæ* [-cum], Brazil, iid. l. c. pl. cxii. figs. 3, 6, 12-14.
Arete senica, Felder, l. c. pl. cxiii. fig. 2 (= *Cocytodes modesta*, V. d. Hoeven, = *immodesta*, Guén., var., Rogenhofer, l. c.).
Catephia ecclesiastica and *dubia*, A. G. Butler, Cist. Ent. i. p. 292, Rockhampton.
Ædia sofala, Felder & Rogenhofer, l. c. pl. cx. fig. 2, Caffraria.
Anophia (?) *corone*, Guiana, and *fatilega*, S. Africa, iid. l. c. pl. cxii. figs. 5 & 9.
Stictoptera alutacea, iid. l. c. pl. cxii. fig. 4, Cape of Good Hope; *S. divaricata*, A. R. Grote, Rep. Peab. Ac. vi. p. 37, Wisconsin.
Acantholipes trimeni, Felder & Rogenhofer, l. c. pl. cviii. fig. 7, S. Africa.
Leucanitis schraderi, iid. l. c. pl. cxvi. fig. 7, Australia; *L. spilota*, N. Erschoff, l. c. p. 56, pl. iv. fig. 58, Kisil-kum.
Panula insipida, Felder & Rogenhofer, l. c. pl. cxii. fig. 16, Mexico.
Bolina bisinuata, iid. l. c. pl. cxii. fig. 19, La Plata.
Melipotis ambidens, Bengal, and *glutiani*, Amboina, iid. l. c. pl. cxvi. figs. 9 & 10.
Syneda langi, N. Erschoff, l. c. p. 54, pl. iv. fig. 57, Sarafschan; *S. deducta* and *pavitensis*, H. K. Morrison, l. c. pp. 220 & 221, Waco, Texas.
Hypocala tryphænina, Felder and Rogenhofer, l. c. pl. cxii. fig. 20, Moreton Bay.
Catocala aholibah, p. 72, pl. ix. fig. 5, California, *aspasia*, p. 94, California, Texas, *agrippina*, figs. 1-3, and *sappho*, fig. 4, Texas, *judith*, fig. 5, New York State, p. 95, *amestris*, *delilah*, and *uholah*, figs. 6-8, p. 96, Texas, *magdalena*, p. 93, fig. 9, Indiana, Texas, *atarah*, figs. 10 & 11, and *myrrha*, fig. 12, Texas, *mariana*, *hippolyta*, *cleopatra*, *luciana*, p. 99, and *perdita*, p. 100 (Edw. MS.), California, H. Strecker, Lepidoptera; *C. whitneyi*, G. M. Dodge, Canad. Ent. vi. p. 125, United States; *C. editha*, W. H. Edwards, Tr. Am. Ent. Soc. v. p. 112, Arizona; *C. simulatilis*, p. 94, Ohio, *levettii*, p. 95, Indianapolis, *adoptiva*, Texas, *celebs*, St. Catherine's, *anna*, Texas, p. 96, A. R. Grote, op. cit.; *C. residua*, id. P. Bost. Soc. xvi. p. 242, New York, Canada; *C. semirelictæ*, id. Rep. Peab. Ac. vi. p. 35, Bull. Buff. Soc. ii. pl. i. fig. 11, Ontario; *C. actæa*, Japan, and *patala*, N. India, Felder & Rogenhofer, l. c. pl. cxii. figs. 22 & 23.
Ophideres archon, Felder, l. c. pl. cxiii, fig. 3, Siam.
Graphigona roseifer, Felder & Rogenhofer, l. c. pl. cxiv. fig. 7, Amazon region.
Potamophora albata, Felder, l. c. pl. cxiii. fig. 4, Amboina.
Lygniodes orbifera, id. l. c. pl. cxiii. figs. 5 & 6, Moluccas.
Peosina (?) *thalia*, Felder & Rogenhofer, l. c. pl. cxiv. fig. 3, Amazon region.
Brujas festonata, iid. l. c. pl. cxiv. fig. 1, Mexico.

Letis melba, Amazon, fig. 8, *steatornis*, Demerara and Maranhã, fig. 9, *opalisans*, Amazon, Demerara, figs. 10 & 11, *iid.* l. c. pl. cxiv.

Tarvia (?) *martina*, *iid.* l. c. pl. cxiv. fig. 6, Sumatra.

Cremnoides (?) = *Naharra*, Walk.) *lemur*, Felder, l. c. pl. cxiii. fig. 9, Moluccas.

Syrnia nuchalis, Felder & Rogenhofer, l. c. pl. cxiv. fig. 2, Amazon region.

Spiredonia conspicua, Felder, l. c. pl. cxiii. fig. 7, Andaman Islands.

Argiva orcina, Felder & Rogenhofer, l. c. pl. cxv. fig. 14, Moluccas ;

A. celebensis, C. Hopffer, S. E. Z. xxxv. p. 46, Celebes.

Calliodes rubripicta, A. G. Butler, Ent. M. M. xi. p. 77, Moreton Bay.

Spirama lucida, R. Felder, l. c. pl. cxiii. fig. 8, Natal ; *S. voluta*, Felder & Rogenhofer, l. c. pl. cxv. fig. 9, Moluccas.

Hypopyra dulcina, Japan, *grandæva*, Malacca, and *pandia*, India, Felder & Rogenhofer, l. c. pl. cxv. figs. 10-12.

Entomogramma squamicornis, Java, *vanua*, Viti, and *panthera*, Natal, *iid.* l. c. pl. cxv. figs. 3, 4 & 6.

Lagoptera miniacea, *iid.* l. c. pl. cxvi. fig. 8, Viti.

Phoberia (?) *fatua*, *P. catocala* and *korana*, *iid.* l. c. p. cxvi. figs. 1-3, S. Africa.

Pseudophia welwitschi, *iid.* l. c. pl. cxv. fig. 2, S. Africa.

Ophisma sumatrana, Sumatra, *limbata*, Natal, *anetica*, Viti, *basigutta*, Cayenne, *tropicalis*, S. America, *morbillosa*, Amazon region, *O.* (?) *sculpta*, Cayenne, *iid.* l. c. pl. cxvi. figs. 5, 6, 11, 12, 14 & 15, and pl. cxvii. fig. 26.

Achæa (?) *dasynota*, pl. cxii. fig. 10, Cayenne, *A.* (?) *leonæ*, Sierre Leone [? = *ezea*, Cram.], *mania*, Natal, and *radama*, Madagascar, pl. cxvi. figs. 13, 16 & 17 ; *iid.* l. c.

Serrodes (?) *xanthorrhæa*, *iid.* l. c. pl. cxii. fig. 21, Australia.

Calesia (?) *cirrus*, pl. cviii. fig. 44, Philippines, *C. patna*, Bengal, *stillifera*, Manila, and *pellio*, Amboina, pl. cxvii. figs. 16-19, *iid.* l. c.

Athyra tuberosa, *iid.* l. c. pl. cxvii. fig. 21, Amazon region.

Ophiusa constricta, Rockhampton, and *O.* (?) *latizona*, Queensland, A. G. Butler, Cist. Ent. i. p. 293 ; *O.* (Hüb., = *Toxocampa*, Guén.) *andersoni*, Felder & Rogenhofer, l. c. pl. cxv. fig. 13, S. Africa.

Fodina sarmentosa, *iid.* l. c. pl. cxvii. fig. 16, Australia.

Elpia (?) *replicata*, *iid.* l. c. pl. cxvii. fig. 25, Cayenne.

Grammodes tedia, *iid.* l. c. pl. cxv. fig. 1, S. Africa.

Chalciope mahura, Natal, and *deltifera*, Bogos, *iid.* l. c. pl. cxvii. figs. 13 & 24.

Heteropygas ligia, Amazon region, and *ziczac*, Brazil, *iid.* l. c. pl. cxvii. figs. 8 & 14.

Drasteria pavona, *iid.* l. c. pl. cxviii. fig. 9, N. India.

Euclidia pohli, Amazon region, *tephrina*, S. America, *aquamarina*, California, *runica*, Chili, *iid.* l. c. pl. cxvii. figs. 3, 7, 10 & 11 ; *E. mirifica*, N. Er choff, l. c. p. 54, pl. iv. fig. 56, Kisil-kum.

Phurys proluxa, Amazon region, and *coactilis*, Cayenne, Felder & Rogenhofer, l. c. pl. cxvii. figs. 6 & 15.

Mocis pertusa, iid. l. c. pl. cxv. fig. 7, Bogotá (? = *M. alvina*, Guén., var.).

Remigia (?) *crinipes*, pl. xiv. fig. 4, Celebes, *R. hansali*, Bogos, and *alipes*, Guatemala, pl. cxvii. figs. 5 & 12; iid. l. c.

Felinia (?) *adspersa*, iid. l. c. pl. cxvii. fig. 23, Celebes.

Zethes alfura, iid. l. c. p. cxix. fig. 27, Celebes.

Focilla intacta, *fulica*, and *bendina*, Amazon region, figs. 18, 21 & 23, *facunda*, Amazon region and Cayenne, fig. 22, pl. cxviii., *sita*, Celebes, pl. cxx. fig. 40, iid. l. c.

Goniapteryx (?) *morada*, iid. l. c. pl. cxx. fig. 26, Amazon region.

Amphigonina (?) *inopia*, Cayenne, *erythropus* and *laciniata*, S. America, iid. l. c. pl. cxviii. figs. 8, 25 & 26.

Sympis discipuncta, iid. l. c. pl. cxviii. fig. 11, Amboina.

Argidia aganippe and *subrubra*, iid. l. c. pl. cxviii. figs. 27 & 28, Amazon region.

Apistis mormon, iid. l. c. pl. cxviii. fig. 16, Bogotá.

Orthogramma (?) *rufitibia*, iid. l. c. pl. cxvii. fig. 1, Amazon region.

Sanys (?) *javana*, iid. l. c. pl. cxix. fig. 28, Java.

Thiona (?) *filamentosa*, iid. l. c. pl. cxix. fig. 18, Amazon region.

Thermesia (?) *fenestrina*, Celebes, pl. cxvii. fig. 2, *adelphe*, Bogotá, *T. icterodes*, *octophora*, and *scalena*, Amazon region, *infumata*, Cayenne, and *lilacina*, Amazon region, pl. cxviii. figs. 6, 7, 12, 13, 17 & 30, iid. l. c.

Azasia (?) *navigatorum*, iid. l. c. pl. cxvii. fig. 4, Viti.

Azeta (?) *caudalis*, Bogotá, *hypopyrina*, Cayenne, and *leucoma*, Amazon region, pl. cxviii. figs. 5, 19 & 20, *A.* (?) *pertinax*, Ceylon, figs. 1 & 2, and *mimica*, Maranham, fig. 7, pl. cxix., iid. l. c.

Selenis compacta, *yrias*, and *gallinago*, Amazon region, figs. 1, 4 & 9, *anguinea* and *lignaria*, Brazil, figs. 2 & 3, *digna*, Bogotá, fig. 10, iid. l. c. pl. cxviii.

Thyriodes (?) *sublimpida*, iid. l. c. pl. cxix. fig. 13, Amazon region.

Renodes nisoria, America, figs. 11 & 11a, *biremosa*, Amazon region, fig. 19, and *hamada*, Japan, fig. 23, iid. l. c. pl. cxix.

Gracilodes (?) *amaponda*, fig. 25, and *fumipennis*, figs. 29 & 29a, Natal, pl. cxix., *G. ludiana*, pl. cxx. fig. 25, India, iid. l. c.

Pangrapta thetys, Amazon region, and *P.* (?) *pensilis*, Japan, iid. l. c. pl. cxx. figs. 16 & 23.

Marmorinia (?) *nara*, iid. l. c. pl. cxx. fig. 47, Amboina.

Capnodes orbiculata, S. America, *binota*, Brazil, pl. cxviii. figs. 14 & 15, *c-album* and *incarnans*, Amazon region, figs. 6 & 14, *turtur*, *uncinata*, and *lincus*, Brazil, figs. 8, 10 & 12, *subguttata*, Cayenne, fig. 9, *rubecula*, Amazon region and Cayenne, fig. 15, *bira*, Venezuela, fig. 26, pl. cxix., *undina*, pl. cxx. fig. 46, S. America, iid. l. c.

Metria platypoda, iid. l. c. pl. cxx. fig. 44, Amboina.

Hypenaria ampelina, Brazil, and *mucescens*, Amazon region, iid. l. c. pl. cxix. figs. 30 & 31.

Plaxia amita, iid. l. c. pl. cxix. fig. 24, S. America.

Oxydercia acripennis, iid. l. c. pl. cxx. fig. 24, Amazon region.

Chadaca (?) *renirula*, iid. l. c. pl. cxix. fig. 17, Amazon region.

Ariola bryophilina, iid. l. c. pl. cxx. fig. 10, Ceylon.

DELTOIDÆ.

Hypena revolutalis, Zell., noticed and figured by N. Erschoff, Lep. Turk. p. 59, pl. iv. fig. 1x.

Bomolocha. A. R. Grote admits 6 North American species; Canad. Ent. v. p. 226.

Cacographis osteolalis, Led., from Bogotá, figured by Felder & Rogenhofer, Reise Novara, Lep. iv. pl. cxx. fig. 14.

Epipaschia, Clem. (= *Deuterophylla*, Led.), probably belongs to the *Pyralidæ*; A. R. Grote, Bull. Buff. Soc. ii. p. 77.

New genera and species :—

Pseudaglossa, A. R. Grote, Bull. Buff. Soc. ii. p. 47. Type, *Epizeuxis lubricalis*, Geyer.

*Sisyrrhyphen*a, id. Canad. Ent. v. p. 227. Allied to *Tetanolita*; type, *S. pupillaris*, sp. n., id. *ibid.*, Philadelphia, Texas.

Euclytis myodes, Felder & Rogenhofer, l. c. iv. pl. cxix. fig. 22, Brazil.

Colobochila (?) *elicrina*, Amazon region, and *personalis*, Viti, New Holland, *ibid.* l. c. pl. cxx. figs. 17 & 20.

Bomolocha scutellaris, A. R. Grote, l. c. p. 225, Albany, Quebec.

Hypena (?) *perna*, Bengal, *H. beatalis*, S. Africa, *colabalis*, Amboina, *sclerialis*, Amazon region, *plumalis*, Venezuela, and *lineata*, Malacca, Felder & Rogenhofer, l. c. pl. cxx. figs. 8, 19, 29, 32, 36 & 39; *H. olivacea*, A. R. Grote, l. c. p. 226, Albany.

Cyclopteryx (?) *macrops*, Felder & Rogenhofer, l. c. pl. cxx. fig. 15, Amazon region.

Rivula (?) *palliceps*, *ibid.* l. c. pl. cxx. fig. 2, Amazon region.

Luceria burgessi, p. 109, Tuckernuck Island, near Nantucket, *loculata* and var. *conspicua*, pp. 110 & 111, Massachusetts and New York, H. K. Morrison, Bull. Buff. Soc. ii.

Episparis davallia, Felder & Rogenhofer, l. c. pl. cxx. fig. 41, Bengal.

Simplicia tibialis, Brazil, and *S. (?) infausta*, Sarawak, *ibid.* l. c. pl. cxx. figs. 43 & 45.

Herminia (?) *kerina*, *ibid.* l. c. pl. cxx. fig. 38, Natal.

Zanclognatha mindora, Sarawak, and *Z. (?) denisii*, Guiana, *ibid.* l. c. pl. cxx. figs. 27 & 28.

Antiblemma (Hüb., re-characterized, l. c.) *canalis*, A. R. Grote, Bull. Buff. Soc. ii. p. 76, New York; *A. (?) goleta*, Felder & Rogenhofer, l. c. pl. cxx. fig. 5, Natal.

Physula (?) *palindia*, *ibid.* l. c. pl. cxx. fig. 7, Amazon region.

Omiodes (?) *tortola*, *ibid.* l. c. pl. cxx. fig. 9, Cayenne.

Hydrillodes (?) *tunicula*, *ibid.* l. c. pl. cxx. fig. 30, Amazon region.

Epizeuxis (?) *crucialis*, *ibid.* l. c. pl. cxx. fig. 37, Java.

Rejectaria galealis, *ibid.* l. c. pl. cxx. fig. 21, Amazon region.

Megatomis remulans, and *mikani*, Amazon region, figs. 3 & 31, *M. (?) sapota*, Cayenne, fig. 12, *ibid.* l. c. pl. cxx.

Psephis (?) *æga*, *ibid.* l. c. pl. cxx. fig. 4, Amazon region.

Blemmatia (?) *gallinalis*, Venezuela, and *carapa*, Amazon region, iid. l. c. pl. cxx. figs. 22 & 34.

Heterogramma appensa, iid. l. c. pl. cxx. fig. 13, hab. ?

Mustigophora marina, iid. l. c. pl. cxx. fig. 11, Amazon region.

Bertula (?) *monstrosalis*, iid. l. c. pl. 120, fig. 33, Venezuela.

Scopifera longipalpis, iid. l. c. pl. cxx. fig. 35, South America.

Bocana (?) *achine*, iid. l. c. pl. cxx. fig. 18, Ceylon.

Echana (?) *tennenti*, iid. l. c. pl. cxix. fig. 1, Ceylon.

Catada (?) *epops*, iid. l. c. pl. cxx. fig. 42, India, Ceylon.

GEOMETRIDÆ.

P. C. T. Snellen gives a list of the *Geometræ* collected by Von Nolcken in New Granada, St. Thomas, and Jamaica, with remarks on known species and genera, and descriptions and figures of many new. Tijdschr. Ent. xvii. pp. 1-109, pls. i.-iv.

A *Geometra* larva found eating oak-galls; W. A. Forbes, Ent. vii. p. 165.

A. Fuchs (S. E. Z. xxxv. pp. 241-243) briefly notices *Macaria signaria*, *Gnophos glaucinaria*, var. *plumbearia*, *Cidaria olivata*, *Eupithecia insigniata*, *togata*, *millefoliata*, and *subciliata*.

J. A. Lintner notices the larvæ of *Nematocampa filamentaria* and *Ennomos magnaria*, Guén., p. 165, and describes that of *Amphidasys cognataria*, Guén., p. 166; Rep. N. York Mus. xxvi.

A. S. Packard has published a second instalment of his catalogue of the *Phalænidæ* of California; P. Bost. Soc. xvi. pp. 13-40, pl. i. [for introductory portion, cf. Zool. Rec. x. p. 375].

Sericoptera, H. S., = *Ripula*, Guén.; P. C. T. Snellen, l. c. p. 11.

Endropia mixtaria, Walk., figured by A. G. Butler, Lep. N. Zealand, pl. iii. fig. 5. *E. venosaria*, G. & R., figured by A. S. Packard, Hayden's U. S. Survey, 1873, fig. 9.

Ellopiæ prasinaria, Hübn., = *prosapiaria*, L., var.; L. Berce, Lep. France, v. pp. 13 & 14. *E. (Abrazas) ribearia*, Fitch, transformations figured and described by W. Saunders, Canad. Ent. vi. pp. 138 & 139.

Rumia cratægata, var. noticed; C. G. Barrett, Tr. Norw. Soc. 1873-74, Suppl. p. 17.

Selenia gallaria, Walk., figured by A. G. Butler, l. c. pl. iii. figs. 6 & 7.

Azelina caninata, Guén., noticed and figured by P. C. T. Snellen, l. c. p. 30, pl. ii. fig. 4.

Crocallis trapezaria, Boisd., probably = *elinguaria*, L.; L. Berce, l. c. p. 30.

Nyssia pomonaria. On variation in the larva, according to food-plant; J. Fallou, Bull. Soc. Ent. Fr. (5) iv. p. lxiv.

Biston betularia: a buff var. noticed; T. Lomas, Ent. vii. p. 164. *B. lapponaria*, Boisd., figured; Ent. Ann. 1874, fig. 2.

Boarmia attracta, Walk., figured by A. G. Butler, l. c. pl. iii. fig. 9. *B. glabraria*, Hübn., two aberrations described; A. Fuchs, JB. nass. Ver. xxvii. & xxviii. pp. 178 & 179. *B. larvaria*, Guén., larva noticed; W.

Saunders, *l. c.* pp. 32 & 33. *B. roboraria*, transformations described; J. Hellins, Ent. M. M. xi. p. 86.

Tephrosia ferruginosaria, Pack., pl. i. fig. 21, and *canadaria*, Guén., noticed by A. S. Packard, P. Bost. Soc. xvi. p. 33. *T. patularia*, Walk., figured by A. G. Butler, *l. c.* pl. iii. fig. 8.

Gnophos pullata, var. *nubilata*. Larva described and imago noticed; A. Fuchs, S. E. Z. xxxv. pp. 79-81.

Nemoria aureliaria and *bryandaria*, Mill., are probably vars. of *N. viridata*; L. Berce, *l. c.* pp. 106 & 107.

Palyas imperata, Guén., = *fimbriaria*, Cram.; P. C. T. Snellen, *l. c.* p. 42.

Cambogia heliadaria, Guén., noticed and figured; *id. l. c.* p. 47, pl. iii. fig. 9.

Athena blomeraria, transformations described by J. Hellins, *l. c.* pp. 87-89. *A. ondinata*, Guén., figured by A. G. Butler, *l. c.* pl. iii. fig. 20.

Acidalia californiaria, 5-linearia, and *rubromarginaria*, A. S. Packard, figured by him, *l. c.* pl. i. figs. 16-18; *A. beckeraria*, Led., figured by N. Erschoff, Lep. Turk. pl. v. fig. 76; *A. contiguaria*, Hüb., larva described by A. Fuchs, *l. c.* pp. 81-85, cf. also p. 241; *A. levigaria* new to the Parisian fauna, J. Fallou, Bull. Soc. Ent. Fr. (5) iv. p. cccxxxiii; *A. pulchraria*, Doubl., and *absconditaria*, Walk., figured by A. G. Butler, *l. c.* pl. iii. figs. 18 & 21. *A. straminata*: larva described by G. T. Porritt, Ent. M. M. xi. pp. 116 & 117.

Eupisteria heparata. Larva described; *id.* Ent. vii. pp. 175 & 176.

Bapta viatica, Harvey, = *Corycia semiclavata*, Walk.; H. Strecker, Lepidoptera, p. 93.

Macaria californiaria, A. S. Packard, re-described and figured by him, *l. c.* p. 27, and Hayden's U. S. Survey, 1873, Moths, fig. 7; *M. dispuncta*, Walk. (= 6-maculata, Pack.), re-described, *id. l. c.* p. 553.

Panagra hypenaria, Guén., figured by A. G. Butler, *l. c.* pl. iii. fig. 10. It probably belongs to a new genus; *id. l. c.* p. 13.

Selidosema juturnaria, Guén., figured by A. S. Packard, P. Bost. Soc. xvi. pl. i. fig. 19.

Fidonia atomaria, hermaphrodite; Lelièvre, Pet. Nouv. vi. p. 409. *F. (?) brephosata*, Walk., figured; A. G. Butler, *l. c.* pl. iii. fig. 3.

Phasiane rippertaria, Dub. An aberration described and figured by N. Erschoff, *l. c.* p. 66, pl. v. fig. 75.

Sterrhia anthophilaria, Hüb.: var. *n. albidorsa* from the river Jaxartes described; *id. l. c.* p. 69.

Gorytodes uncanaria, Guén., re-described and figured by A. S. Packard, *l. c.* p. 24, pl. i. fig. 24.

Aspilates (?) pruinata, Walk., figured by A. G. Butler, *l. c.* pl. iii. fig. 4; *A. quadrifasciaria*, A. S. Packard, figured, Hayden's U. S. Surv., 1873, Moths, fig. 3.

Zerene catenaria, Drury, noticed and figured; *id. l. c.* p. 551, fig. 2.

Ligdia adustata. Life history; P. H. Jennings, Ent. vii. pp. 229 & 230.

Ligia arenacearia, Hüb., var. *flavidaria*, Eversm., figured by N. Erschoff, *l. c.* pl. iv. fig. 68.

Hybernia ankeraria. Female described by O. Staudinger, S. E. Z. xxxv. p. 96.

Anisopteryx vernata and *pometaria*: on their distinctive characters, H. K. Morrison, Canad. Ent. vi. pp. 29-32; B. P. Mann & Peck, P. Bost. Soc. xv. pp. 381-384, xvi. pp. 204-209. On a monstrous ♀ of the latter with aborted wings, and the structure of the pupa; Mann, l. c. xvi. pp. 163-165. The larvæ of both species have been destroyed in Philadelphia by the introduction of the English sparrow, but those of *Orgyia leucostigma*, which are distasteful to the bird, have now become equally numerous and annoying; C. V. Riley, Rep. Ins. Mo. vi. pp. 24-29.

Chimatobia brumata. Ravages on oaks in Galicia; M. Nowicki, Verh. z.-b. Wien, xxiv. p. 372. ♀, Fetting, Pet. Nouv. vi. p. 404. Also noticed, P. E. Soc. 1874, p. xxx.

Larentia cumatilis, G. & R. (= *4-punctata*, Pack.), noticed and figured by A. S. Packard, P. Bost. Soc. xvi. pl. i. fig. 8. *L. invezata*, *punctilineata*, and *clarata*, Walk., figured by A. G. Butler, l. c. pl. iii. figs. 11, 12 & 14. *L. olivata*: transformations; J. Hellins, l. c. p. 86.

Emmelesia unifasciata remaining three years in pupa; A. H. Jenner, Ent. M. M. xi. p. 140.

Eupithecia. List of 32 species found at Osterwieck in the Hartz; W. Henäcker, S. E. Z. xxxv. pp. 419-421. C. Dietze (Beiträge zur Kenntniss der Arten der Gattung *Eupithecia*, Curt.; S. E. Z. xxxv. pp. 209-221, 270-277) remarks on various known species, and describes in full the larvæ of *tamarisciata*, Freyer, *veratraria*, H. S., *pusillata*, var. *laricis*, Spey., an undetermined Swiss species, and *pygmæata*, Hübn.; and the eggs of *doneata*, *indigata*, *pusillata*, *arceuthata*, *rectangulata*, and *cauchyata*; he also describes the transformations of *lanceata*, Hübn., and describes, but does not name, a new species from the Stifiser-Joch, Tyrol. *E. doneata* remaining two years in pupa; E. S. Hutchinson & J. Hellins, Ent. M. Mag. x. p. 277, and xi. p. 16. *E. nevadata*, A. S. Packard, figured by him, l. c. pl. i. fig. 2. *E. inezpiata*, Walk., figured by A. G. Butler, l. c. pl. iii. fig. 18. *E. innotaria*, ? = *egenaria*, Doubl. List: cf. C. S. Gregson & H. Doubleday, Ent. vii. pp. 68, 69, 87 & 88. On food-plant of *innotata*, which is not ascertained to be British; H. H. Crewe, op. cit. vii. p. 291. A new species?, from N. Finland, allied to *helveticaria*; J. G. Schilde, S. E. Z. xxxv. p. 75.

Scordylia mortipax, Butl. & Druce, figured by A. G. Butler, Lep. Exot. pl. lxi. fig. 18.

Coremia rosearia, Doubl., figured; *id.* Lep. N. Zealand, pl. iii. fig. 13.

Camptogramma correlata, Walk., and *subochraria*, Doubl., figured; *id.* l. c. pl. iii. fig. 15. *C. fluviata*, Hübn., recorded from California; A. S. Packard, l. c. p. 19.

Scotosia californiata, A. S. Packard, figured by him, l. c. pl. i. fig. 12. *S. dubitata* from Montreal, described and figured by L. F. Harvey, Bull. Buff. Soc. i. p. 264, pl. xi. fig. 7.

Cidaria nubilata, p. 20, and *leonata*, pl. i. fig. 13, of A. S. Packard, noticed by him, l. c. *C. truncata*, *russata*, and *immanata* are varieties of one species; J. G. Schilde, l. c. p. 73. *C. serraria*, Zett., also noticed; *id.* l. c. p. 74. *C. picata*: life history; P. H. Jennings, Ent. vii. p. 230.

C. reticulata, Fabr., Hüb. (*nec* Thunb.), re-named *dictyides*; H. D. J. Wallengren, Ind. Noct. & Geom. Scand. p. 29.

Lygris destinata, Möschler: many varr. from Labrador described by the author, S. E. Z. xxxv. p. 160. *L. reticulata*, Fabr., transformations, &c., described; A. Fuchs, *op. cit.* pp. 237-240.

Eubolia lineolata. Transformations described; W. Buckler, Ent. M. M. x. pp. 255 & 256.

Emplocia primulina, Butler & Druce, figured by A. G. Butler, Lep. Exot. pl. lxi. fig. 3.

New genera and species :—

Eurhinosea, A. S. Packard, P. Bost. Soc. xvi. p. 34. Allied to *Caustoloma*; type, *E. flavaria*, sp. n., *id. l. c.* p. 35, Sierra Nevada.

Chlorosea, *id. l. c.* p. 31. Allied to *Nemoria*; type, *C. nevadaria*, sp. n., *id. ibid.*, Nevada.

Evaspilates, *id. Rep. Peab. Ac. vi.* p. 45. Type, *E. spinataria*, sp. n., *id. ibid.*, and Hayden's U. S. Survey, 1873, p. 551, fig. 4, Colorado.

Tatosoma, A. G. Butler (= *Cidaria*, group 2, Walk.), Cat. Lep. N. Zealand, p. 17. Type, *C. agrionata*, Walk.

Sabulodes arenularia and *glaucularia*, P. C. T. Snellen, Tijdschr. Ent. xvii. pp. 12, 13, pl. i. figs. 1 & 2, Bogotá.

Ozydia hypenariata and *hypopyrata*, *id. l. c.* pp. 14 & 15, pl. i. figs. 3 & 4, Anolaima?

Apicia prostypata, Anolaima?, *phibalaria* and *plebejata*, Cucuqueta, *id. l. c.* pp. 17-19, pl. i. figs. 5-7.

Eutrapela falcata, A. S. Packard, P. Bost. Soc. xvi. p. 39, pl. i. fig. 22, California.

Drepanodes panamaria, *id. l. c.* p. 39, Panama.

Sicya crocearia, *id. l. c.* p. 36, California, Nevada.

Hesperumia (characterized) *ochreatea*, *id. l. c.* p. 37, California, Nevada.

Caustoloma [*Caustoloma*] *occiduaria*, *id. Rep. Peab. Ac. vi.* p. 52, and Hayden's U. S. Survey, 1873, p. 554, fig. 8, Oregon and Colorado.

Endropia warneri, L. F. Harvey, Bull. Buff. Soc. ii. p. 121, New York State.

Metrocampa viridoperlata [!], A. S. Packard, P. Bost. Soc. xvi. p. 38, California.

Epione bogotata [!], P. C. T. Snellen, *l. c.* p. 20, pl. i. fig. 8, Barro Blanco?

Perusia sulphurata, *tenerata*, and *citrinata*, *id. l. c.* p. 24, pl. i. figs. 9 & 10, pl. ii. fig. 1, Bogotá.

Leucula flavilinguaria, *id. l. c.* p. 27, hab.?

Tetracis parallelia, A. S. Packard, *l. c.* p. 38, California; *T. brantsiata*, P. C. T. Snellen, *l. c.* p. 28, pl. ii. fig. 2, hab.?

Eurymene excavaria, H. K. Morrison, Bull. Buff. Soc. i. p. 189, New York.

Azelina maracandaria, N. Erschoff, Lep. Turk. p. 62, pl. iv. fig. 66, Sarafschan; *A. nolckeniata* [!], P. C. T. Snellen, *l. c.* p. 29, pl. ii. fig. 3, Bogotá.

- Odontopera bistonaria*, id. l. c. p. 31, pl. ii. fig. 5, Barro Blanco.
Crocallis tropicaria, id. l. c. p. 32, pl. ii. fig. 6, Anolaima?
Metanema aurantiacaria, A. S. Packard, l. c. p. 34, Nevada.
Himera stchurovskii, N. Erschoff, l. c. p. 63, pl. iv. fig. 64, Samarcand.
Biston cinerarius, id. l. c. p. 64, pl. iv. fig. 65, Samarcand.
Hemerophila latifasciaria, A. S. Packard, l. c. p. 33, California.
Cleora umbrosaria, id. l. c. p. 23, California.
Boarmia cocandaria, N. Erschoff, l. c. p. 65, pl. iv. fig. 63, Khokand;
B. muscinaria, p. 33, Barro Blanco?, *fuscolimbaria*, p. 35, hab.?, *elongaria*, p. 36, Ubaque and Cucqueta, *odysiata*, p. 37, Ubaque, *agnataria*, p. 38, Anolaima?, P. C. T. Snellen, l. c. pl. ii. figs. 7-9, pl. iii. figs. 1 & 2.
Cymatophora [= *Boarmia*, auctt.] *5-linearia*, Texas, and *plumosaria*, Alabama, A. S. Packard, Rep. Peab. Ac. vi. p. 51.
Tephrosia nigroseriata and *falcataria*, pl. i. fig. 20, id. P. Bost. Soc. xvi. p. 32, California.
Gnophos iveni, N. Erschoff, l. c. p. 66, pl. iv. fig. 67, Khokand.
Eunemorina (characterized) *unitaria*, Nevada, and *tricoloraria*, California, A. S. Packard, l. c. p. 30.
Racheospila leucoceraria, Bogotá, and *rufidorsaria*, Rio Magdalena, P. C. T. Snellen, l. c. p. 41, pl. iii. figs. 3 & 4.
Palyas prospectata, id. l. c. p. 43, pl. iii. fig. 5, hab.?
Ophthalmophora lyonetaria, id. l. c. p. 44, pl. iii. fig. 6, hab.?
Zonosoma conspiciellaria, Ubaque, *olivaria*, hab.?, id. l. c. pp. 45 & 46, pl. iii. figs. 7 & 8.
Cambogia adimaria, Barro Blanco?, *sagittaria*, Anolaima?, p. 48, *hyriata*, Mochila, p. 49, id. l. c. pl. iii. figs. 10-12.
Hyria occidentaria, A. S. Packard, l. c. p. 29, pl. i. fig. 4, California.
Asthenia subcrocearia, Anolaima, and *relaxaria*, Cucqueta, P. C. T. Snellen, l. c. pp. 51 & 52, pl. iv. figs. 1 & 2.
Acidalia adulteraria, Kisil-kum, and *halincodendrata*, river Jaxartes, N. Erschoff, l. c. p. 60, pl. iv. figs. 61 & 62; *A. albogilvaria*, p. 194, *cacuminaria*, p. 195, H. K. Morrison, P. Bost. Soc. xvi.; *A. rubrolinaria* and *subalbaria*, A. S. Packard, op. cit. p. 28, pl. i. figs. 14 & 15, California; *A. thalassinata*, Rio Magdalena, p. 54, *computaria*, Conejo, p. 55, *chlorosata*, Bogotá, p. 56, *convictorata*, Ubaque, p. 57, *collustrata*, Cucqueta, p. 58, *leuculata*, Anolaima?, and *perlimbata*, Barro Blanco, p. 59, and *subnictata*, Barro Blanco and Cucqueta, p. 60, P. C. T. Snellen, l. c. pl. iv. figs. 3-10.
Bapta viatica, L. F. Harvey, Bull. Buff. Soc. i. p. 265, pl. xi. fig. 6, Catskills, Quebec.
Falcinodes gonodontaria, p. 61, pl. iv. fig. 11, *suggilaria*, p. 63, pl. v. fig. 1, P. C. T. Snellen, l. c. Rio Magdalena.
Erosia ochodontaria, Cucqueta, p. 65, *nigrocapitata*, New Granada, and *pauzellata*, Barranquilla, p. 66, id. l. c. pl. v. figs. 2-4.
Corycia nicanteria and *circumvallaria*, id. l. c. pp. 67 & 68, pl. v. figs. 5 & 6, Bogotá; *C. triseriata*, A. S. Packard, Rep. Peab. Ac. vi. p. 50, Northern States.
Macaria unimodaria, Massachusetts, and *sectomaculata*, Massachusetts, New York, H. K. Morrison, l. c. pp. 196 & 198; *M. subminiata*, A. S.

Packard, *l. c.* p. 49, Kansas; *M. divergentata*, hab. — ?, and *adrasata*, Jamaica, P. C. T. Snellen, *l. c.* pp. 69 & 70, pl. v. figs. 7 & 8.

Halía 4-linearía and *tripunctaria*, A. S. Packard, P. Bost. Soc. xvi. p. 26, California.

Tephрина argillacearia, id. *l. c.* p. 48, Northern States, Canada.

Phasiane sinuata, Vancouver's Island, p. 45, *trifasciata*, N. H. p. 46, *excurvata*, Rocky Mountains, and *meadiaria*, Colorado, p. 47, A. S. Packard, Rep. Peab. Ac. vi.; *P. flavofasciata*, id., Hayden's U. S. Survey, 1873, p. 552, fig. 5, Colorado.

Panagra subminiata, id. P. Bost. Soc. xvi. p. 25, California.

Lozogramma atropunctata, id. Rep. Peab. Ac. vi. p. 50, Massachusetts.

Fidonia acidaliata, id. *l. c.* p. 48, Colorado; *F. quadripunctata*, H. K. Morrison, *l. c.* p. 199, New York, Massachusetts.

Aspilotes lintneraria, A. S. Packard, *l. c.* p. 44, United States.

Gorytodes trilinearia, id. P. Bost. Soc. xvi. p. 24, pl. i. fig. 23, Nevada, Arizona.

Ligia turanica, N. Erschoff, *l. c.* p. 67, pl. iv. fig. 69, Turkestan.

Hibernia (?) *occutaria*, id. *l. c.* p. 63, pl. vi. fig. 96, Samarcand; *H. oliveacearia*, H. K. Morrison, *l. c.* p. 200, Massachusetts.

Larentia 12-lineata, p. 19, pl. i. fig. 1, California, and *perlineata*, p. 20, note, Albany, N. York, A. S. Packard, *l. c.*; *L. cretacea*, id. Rep. Peab. Ac. vi. p. 40, and P. Bost. Soc. xvi. pl. i. fig. 3, Sierra Nevada; *L. æneiformis*, L. F. Harvey, *l. c.* p. 264, pl. xi. fig. 5, Montreal.

Cyclomia endrotrichiata, P. C. T. Snellen, *l. c.* p. 71, pl. v. fig. 9, Barro Blanco.

Eupithecia (?) *fenestrata*, Alpes Maritimes, *E. primulata*, Celerina, P. Millière, R. Z. (3) ii. pp. 243 & 244; *E. knautiata*, C. S. Gregson, Ent. vii. pp. 255–257, described in all stages, Bolton (= *E. minutata*, Crewe, cf. Doubleday & Newman, Ent. vii. pp. 290 & 291); *E. rubigata*, p. 73, *indefinata*, p. 75, and *vermiculata*, p. 76, P. C. T. Snellen, *l. c.* pl. v. figs. 10 & 11, pl. vi. fig. 1, Bogotá.

Lobophora montanata, A. S. Packard, Rep. Peab. Ac. vi. p. 40, Colorado.

Hypsipetes viridata and *speciosata*, id. P. Bost. Soc. xvi. pp. 21 & 22, California; *H. albifasciata*, id. Rep. Peab. vi. p. 41, and P. Bost. Soc. xvi. p. 40, pl. i. fig. 5, California.

Melanthia brunniciata, id. Rep. Peab. Ac. vi. p. 42, and P. Bost. Soc. xvi. pl. i. fig. 10, California.

Melanippe kodiakata, id. P. Bost. Soc. xvi. p. 23, pl. i. fig. 7, Kodiak Island, Alaska.

Coremia lignicolorata, id. Rep. Peab. Ac. vi. p. 42, and P. Bost. Soc. xvi. pl. i. fig. 11, California.

Rhopalodes patrata, P. T. C. Snellen, *l. c.* p. 77, pl. vi. fig. 2, Anolaima?

Scordylia hippomenata, p. 80, *fluminata*, p. 82, *dispilata* and *monospilata*, p. 83, *ambiguata*, p. 84, and *chrysopterata*, p. 85, id. *l. c.* pl. vi. figs. 3–8, Bogotá.

Phibalapteryx lutulentata and *effluata*, id. *l. c.* pp. 87 & 89, pl. vi. figs. 9

& 10, New Granada; *P. carnata*, A. S. Packard, Rep. Peab. Ac. vi. p. 43, and P. Bost. Soc. xvi. pl. i. fig. 9, California.

Scotosia cunctata and *pallidivittata*, P. T. C. Snellen, l. c. pp. 91 & 92, pl. vii. figs. 1 & 2, Barro Blanco; *S. meadii*, A. S. Packard, Rep. Peab. Ac. vi. p. 41, Colorado.

Cidaria fedtschenkoi, N. Erschoff, l. c. p. 70, pl. iv. fig. 72, Khokand; *C. suspectata* and *algidata*, H. B. Möschler, S. E. Z. xxxv. pp. 160 & 162, Labrador; *C. albo-punctata*, H. K. Morrison, l. c. p. 202, Massachusetts, New Hampshire; *C. glaucata*, A. S. Packard, P. Bost. Soc. xvi. p. 20, pl. i. fig. 6, California; *C. circumcidata*, Bogotá, p. 94, *emmelesiata* and *morbosata*, Barro Blanco, pp. 96 & 97, P. C. T. Snellen, l. c. pl. vii. figs. 3-5.

Psaliodes ocreata, id. l. c. p. 100, pl. vii. fig. 5, hab. — ?

Opsigonia herrichiata, id. l. c. p. 102, pl. vii. fig. 7, Bogotá.

Anaitis excelsata, N. Erschoff, l. c. p. 70, pl. iv. fig. 71, Kisil-kum.

Eubolia momaria and *fulgurata*, P. T. C. Snellen, l. c. pp. 103 & 104, pl. vii. figs. 8 & 9, Barro Blanco ?

Lithostege staudingeri, N. Erschoff, l. c. p. 69, pl. iv. fig. 70, Sarafschan; *S. triseriata*, Colorado, and *rotundata*, California, A. S. Packard, Rep. Peab. Ac. vi. p. 39.

Melanoptilon emplociaria, Tusugusuga, and *suavaria*, hab. — ?, P. C. T. Snellen, l. c. pp. 106 & 107, pl. vii. figs. 10 & 11.

Marmopteryx tessellata, A. S. Packard, Hayden's U. S. Survey, 1873, p. 552, Moths, fig. 6, Arizona.

PYRALIDÆ.

C. Berg (Bol. Ac. Cordova, i. pp. 150-182) describes the *Pyralidina* recorded as found in the Argentine Republic, amounting to only 17 species, as follows (omitting 4, described as new) :—*Aglossa cuprealis*, Hübn., *Asopia farinalis*, Linn., *Nomophila hybridalis*, Hübn., *Botys cespitalis*, W. V., and *rubigalis*, Guén., *Eurycreon rantalis*, Guén. (with transformations), *Samea ecclesiialis*, Guén. (= *castellalis*, Guén.), *Phacellura marginalis*, Cram. (said by Berg, l. c. pp. 276-279, to have been described as new by Weijenbergh, under the name of *Pyralis zapallitalis*, in *Anales de Agricultura*, i. p. 77), and *P. nitidalis*, Cram., *Stenurges designalis*, Guén. (with transformations), *Lineodes serpulalis*, Led. (with transformations), *Siriocauta testulalis*, Hübn., and *Zinckenia perspectalis*, Hübn. A general account of the group is prefixed to the paper.

Pyralis farinalis, L., recorded from California; A. S. Packard, Ann. Lyc. N. York, x. p. 265.

Aglossa pinguinis, L. N. Erschoff figures var. *asiatica*; Lep. Turk. pl. v. fig. 81.

Pyrausta punicealis. Transformations described by J. Hellins, Ent. M. M. xi. pp. 66 & 67.

Asopia costalis. Transformations figured and described; C. V. Riley, Rep. Ins. Mo. vi. pp. 102-107.

Daraba cordalis and *Diasemia grammalis*, Doubl., figured by A. G. Butler, Lep. New Zealand, pl. iii. figs. 22 & 23.

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Cataclysta lemnalis. Habits of larva; E. L. Ragonot, Bull. Soc. Ent. Fr. (5) iv. p. lxxix.

Botys fodinalis, Led., re-described by A. S. Packard, *l. c.* p. 263.

Mesographe stramentalis, Hübner. Larva described; J. A. Lintner, Rep. N. York Mus. xxvi. pp. 164 & 165.

Scopula glacialis, Pack., probably = *S. inquinatalis*, Zell.; A. S. Packard, *l. c.* p. 271.

Nomophila noctuella, Schiff., occurs in California; *id. l. c.* p. 260.

Eudorea coarctalis hybernates; J. B. Hodgkinson, Ent. M. M. xi. p. 19. *E. (?) frigidella*, Pack., = *Pempelia fusca*, Haw.; *E. (?) albisinuata*, Pack., may be distinct from the European *E. centuriella*; A. S. Packard, *l. c.* p. 271.

Ephestia elutella. Transformations; W. Buckler, Ent. M. M. x. pp. 213 & 214. *E. roxburghi*, Gress., noticed; H. G. Knaggs, Ent. Ann. 1874, pp. 159 & 160.

Rhodophaea marmorea. Transformations described; W. Buckler, *l. c.* p. 214.

Pempelia lignosella, Zell. Var. n. *major* from Valparaiso described; P. C. Zeller, Verh. z.-b. Wien, xxiv. p. 430.

Phycita. A species from Spitzbergen noticed; A. E. Eaton, P. E. Soc. 1874, p. vi.

Phycis davisella, Newm., is quite distinct from *P. albariella*; H. Doubleday, Ent. vii. p. 112. H. Moncreaff notices the earlier stages of the larva, and remarks that Morris has figured this species as *P. palumbella*, op. cit. p. 132.

New species :—

Cledeobia consessoralis, p. 72, figs. 77 & 78, & *infumatalis*, p. 73, fig. 79, Turkestan, N. Erschoff, Lep. Turk. pl. v.

Asopia vernaculalis, C. Berg, Bol. Ac. Cordova, i. p. 157, Argentine Republic.

Stemmatophora chilensis, P. C. Zeller, Verh. z.-b. Wien, xxiv. p. 426, Valparaiso.

Hypotia cribellalis, N. Erschoff, *l. c.* p. 73, pl. v. fig. 80, Kisil-kum.

Emprepes pentodontalis, *id. l. c.* p. 75, pl. vi. figs. 97a-c, Sarafschan, Kisil-kum.

Cataclysta metalliferalis, A. S. Packard, Ann. Lyc. N. York, x. p. 265, California.

Botys californicalis, p. 260, *unifascialis* and *profundalis*, p. 261, California, *subolivalis*, p. 261, note, Maine, *mustelinalis*, p. 262, *semirubralis*, p. 263, and *perrubralis*, p. 264, California, *id. l. c.*; *B. hyperborealis*, H. B. Möschler, S. E. Z. xxxv. p. 163, Labrador; *B. fractilinealis* (Christoph, MS.), Samarcand and Persia, and *monialis*, Samarcand, N. Erschoff, *l. c.* pp. 77 & 78, pl. v. figs. 82 & 83.

Eurycreon evanidalis, p. 163, and var. *obsoletalis*, p. 165, *consularis*, p. 165, C. Berg, *l. c.* Argentine Republic.

Ceratoclasia verecundalis, *id. l. c.* pp. 177-181 (transformations described), Argentine Republic.

Scopula occidentalis, A. S. Packard, *l. c.* p. 260, California.

Scoparia rectilinea, P. C. Zeller, *l. c.* p. 427, pl. xii. fig. 3, Vancouver's Island.

Ephestia lugdunella, P. Millière, R. Z. (3) ii. p. 350, Lyons.

Alispa acervella, N. Erschoff, *l. c.* p. 90, pl. v. fig. 94, Kisil-kum.

Zophodia mediterranea, P. Millière, *l. c.* p. 248, Cannes.

Euzophora mistrala, id. *l. c.* p. 250, Cannes.

Homæosoma dealbatella, N. Erschoff, *l. c.* p. 91, pl. vi. fig. 101, Samarcand.

Eucarpia liziviella, id. *l. c.* p. 86, pl. v. fig. 90, Samarcand.

Acrobasis rubrifasciella, A. S. Packard, *l. c.* p. 267, Maine (transformations also described).

Myelois convergens, Sarafschan, and *urbicella*, Jisak, pp. 86 & 87, pl. vi. figs. 98 & 99, *vestaliella* & *albistriga*, p. 88, pl. v. figs. 92 & 93, Kisil-kum, *liturosella*, pl. vi. fig. 100, and *tengstræmiella*, pl. v. fig. 91, p. 89, Samarcand, N. Erschoff, *l. c.*; *M. albiplagiata*, A. S. Packard, *l. c.* p. 269, New Hampshire.

Gymnancyla barbatella, N. Erschoff, *l. c.* p. 85, pl. v. fig. 89, Samarcand.

Nephoteryx latifasciata, Maine, and *roseatella*, Massachusetts, A. S. Packard, *l. c.* pp. 269 & 270.

Pempelia cyriella, figs. 84 & 85, R. Jaxartes, & *obliteratella*, fig. 86, Kisil-kum, p. 83, *campicolella*, Kisil-kum, and *livorella*, Jisak, p. 84, figs. 87 & 88, N. Erschoff, *l. c.* pl. v.; *P. fenestrella* and *leoninella*, p. 259, California, *ovalis*, p. 269, Maine, A. S. Packard, *l. c.*

Eromene californialis, id. *l. c.* p. 264, California; *E. jaxartella*, N. Erschoff, *l. c.* p. 82, river Jaxartes.

Crambus biliturellus, P. C. Zeller, *l. c.* p. 429, Vancouver's Island; *C. carpenterellus*, A. S. Packard, Hayden's U. S. Survey, 1873, p. 548, fig. 1, Colorado.

Schenobius alpherakii, O. Staudinger, S. E. Z. xxxv. p. 97, South Russia.

TORTRICIDÆ.

C. G. Barrett has continued his notes on British *Tortrices*, Ent. M. M. x. pp. 243-247, xi. pp. 12-15, 28-31, 59-62, 132-134, & 152-156.

Tortrix bergmanniana, L., recorded from Vancouver's Island; P. C. Zeller, Verh. z.-b. Wien, xxiv. p. 433. *T. xylostean* and *sorbiana* very destructive to oaks in Galicia; M. Nowicki, Verh. z.-b. Wien; xxiv. pp. 372 & 373. *T. ribeana* and *cerusana* are certainly vars. of one species; H. Doubleday, Ent. M. M. x. p. 253.

Pedisca obscurana, H. S., = *obscurana*, Steph.; C. G. Barrett, *l. c.* x. p. 244.

Teras (*Rhacodia*) *effractana*, Fröl., recorded from Vancouver's Island; P. C. Zeller, *l. c.* p. 431.

Stigmonota weirana, Dougl., is distinct from *nitidana*, Steph.; C. G. Barrett, *l. c.* x. p. 244.

Retinia buoliana injurious to pines in Galicia; M. Nowicki, *l. c.* pp. 370 & 371. *R. pinicolana*, Doubl., is apparently distinct from it; C. G. Barrett, *l. c.* x. pp. 245 & 246.

Carpocapsa nimbana, H. S., described; *id. l. c.* xi. pp. 12 & 13. *C. splendidana*: on a larva supposed to belong to this species, *cf.* Westwood & McLachlan, P. E. Soc. 1874, p. xviii.

Grapholita ulicetana, Haw. Synonymy and varieties; C. G. Barrett, *l. c.* xi. pp. 13 & 14. *G. candidulana*, Nolck., is adopted for *wimmerana*, Zell., *nec* Treitschke; *id. l. c.* pp. 14 & 15.

Cnephasia hybridana and allies; *id. l. c.* pp. 28 & 29.

Euchromia rufana, Scop., probably distinct from *purpurana*, Haw., is re-described; *id. l. c.* pp. 29 & 30.

Sericoris doubledayana, Barrett, figured by H. G. Knaggs, Ent. Ann. 1874, front. fig. 1. *S. irriguana* and *daleana* are quite distinct; J. B. Hodgkinson, Ent. M. M. x. p. 276. *S. irriguana* re-described; C. G. Barrett, *op. cit.* xi. pp. 59-61. *S. herbana* and *rupestrana*, auctt. Brit., are probably varieties of *S. lacunana*; *id. tom. cit.* p. 31.

Argyrolepis mussehliana and *vectisana* are distinct, and should be referred to *Eupacilia*; *A. cnicana* and *badiana* are distinct; *A. maritima* appears to be a var. of *zephyrana* (teste Zeller); *id. l. c.* pp. 133 & 134.

Eupacilia griseana, Stainton & Wilkinson, = *udana*, Guén., and is distinct from *griseana*, Haw.; *id. l. c.* pp. 155 & 156.

Atteria volcanica and *leopardina*, A. G. Butler, figured by him; Lep. Exot. pl. lxi. figs. 4 & 5.

New species :—

Cocoscia (?) *gallicolana*, A. G. Butler, Lep. N. Zealand, p. 20, New Zealand (woodcut of imago, galls, and parasitic ichneumon).

Penthina zelleriana, N. Erschoff, Lep. Turk. p. 94, pl. vi. fig. 104, Khokand; *P. silphana*, P. Millière, R. Z. (3) ii. p. 247, Cannes.

Tortrix arcticana, H. B. Möschler, S. E. Z. xxxv. p. 164, Labrador.

Teras senescens, P. C. Zeller, Verh. z.-b. Wien, xxiv. p. 431, Vancouver's Island.

Asthenia cognatana, C. G. Barrett, Ent. M. M. x. p. 244, Britain.

Retinia pollinis, P. Millière, *l. c.* p. 251, Cannes.

Grapholitha tarandana, H. B. Möschler, *l. c.* p. 165, Labrador; *G. conicolana*, F. J. M. Heylaerts, Jr., Pet. Nouv. vi. p. 380, and Tijdschr. Ent. xvii. pp. 212-217, pl. xii. figs. A-D (described in all stages, and contrasted with its nearest allies).

Sciaphila canuisana, P. Millière, *l. c.* p. 347, Cannes.

Sericoris corculana, P. C. Zeller, *l. c.* p. 433, pl. xii. fig. 5, Vancouver's Island.

Conchylis nomadana, Samarcand, and *retextana*, R. Jaxartes, N. Erschoff, *l. c.* p. 93, pl. vi. figs. 102 & 103.

TINEIDÆ.

V. T. Chambers continues his papers on North American *Micro-Lepidoptera*; Canad. Ent. v. pp. 229-231; vi. pp. 8-11, 49-52, 72-77, 96, 97, 128-130, 149-153, 166-170, 197 & 198. On a collection of *Tineina*

formed by Belfrage in Texas (76 species; only 10 previously known), with the first instalment of descriptions; *id. op. cit.* vi. pp. 229-249.

V. T. Chambers (Cincinnati. Q. J. Sci. i. pp. 193-211) replies to some criticisms of Prof. Frey upon the writings of American Micro-Lepidopterists, and makes the following synonymic notes:—*Gracilaria elegantella*, Frey, = *G. packardella*, Chamb.; *G. mirabilis*, Frey, perhaps = *G. geiella*, Chamb. (= *plantaginiselletta*, Chamb., olim); *Lithocolletis quercetorum*, Frey, = *L. fitchiella*, Clem., = *L. quercifoliella*, Fitch; *L. nonfasciella*, Chamb., and *obsoleta*, Frey, are probably founded on varieties or worn specimens of *L. celtisella*, Chamb.; *L. mirifica*, Frey, perhaps = *ostreæfoliella*, Clem.; *L. consimilella*, Frey, probably = *L. tritaniella*, Chamb.; *L. ulmella*, Chamb., is quite distinct from *L. argentinotella*, Clem.; *L. ignota*, Frey, probably = *L. helianthisella*, Chamb., from which *L. bostonica*, Frey, is perhaps not sufficiently distinct; *L. gemmea*, Frey, = *Parrectopa robiniella*, Clem.; *Tischeria cinea* and *roseticola*, Frey, probably = *T. malifoliella*, Clem., only differing in food plant.

H. T. Stainton, Ent. Ann. 1874, pp. 1-47, epitomises, with comments, the notes published on *Tineina* in the 19 previous volumes of that publication, and (*l. c.* pp. 48-51) points out some deficiencies still remaining in the knowledge of various common species.

Notes on *Tineina* observed in 1873; J. E. Fletcher, Ent. M. M. x. p. 232.

Notes on *Micro-Lepidoptera*; E. L. Ragonot, Pet. Nouv. vi. pp. 448, 451, 456, & 457. He considers the *Choreutidæ* to be a family closely allied to, but distinct from, the *Tineidæ*. Bull. Soc. Ent. Fr. (5) iv. p. clxxiii.

Solenobia inconspicuellæ. A pale variety from St. Leonard's Forest; W. C. Boyd, P. E. Soc. 1874, p. xi.

Scardia boleti. Remarkable nest of larvæ resembling those of this species, found in a granary at Lessines; De Borre, CR. Ent. Belg. xvii. pp. cxxi. & cxxii.

Pronuba yuccasella. Additional observations, and figure of pupa; C. V. Riley, Rep. Ins. Mo. vi. pp. 131-135.

Hyponomeuta mahabellæ, Guén., re-described by E. L. Ragonot, Ann. Soc. Ent. Fr. (5) iv. p. 583. *H. malinella*: its ravages in 1874; A. de Graslin, *op. cit.* Bull. p. cliv. [*H*] *Y. padella*, destructive to plum-trees near Agen, in 1874; J. A. Boisduval, *op. cit.* pp. cxxvii. & cxxviii.

Idophasia messingiella. Habits of larva; H. T. Stainton, *l. c.* p. 163.

Plutella cruciferarum feeds on a species of *Draba* in Spitzbergen; A. E. Eaton, P. E. Soc. 1874, p. vi.

Depressaria (Gelechia) dubitella, Chamb.: larva described; M. E. Murtfeldt, Canad. Ent. vi. pp. 221 & 222. *D. ontariella*, Chamb., = *heracleana*; J. A. Lintner, Rep. N. York Mus. xxvi. p. 145, note. *D. rhodochrella* is a South European species, and the British *rhodochrella* probably = *variabilis*, v. Hein.; H. T. Stainton, *l. c.* pp. 10 & 11. *D. yeatiana*; larva noticed by Jordan & Stainton, Ent. M. M. xi. p. 157.

Cryptolechia schlagerei, Zell., is undistinguishable, when at rest, from a patch of bird excrement; J. A. Lintner, *l. c.* xxvi. p. 184, note.

Gelechia fischerella. Larva very destructive to grass seeds; H. T. Stainton, Ent. Ann. 1874, p. 23.

Eidothoa. Chambers corrects his genus to *Eidothea* [*Ido-*], Canad. Ent. v. p. 229.

Ecocecis guyonella, Guén.; E. L. Ragonot, Bull. Soc. Ent. Fr. (5) iv. pp. ccxliii., ccxliv., ccliii. & ccliv.

Butalis acanthella, Godt.; *id.* l. c. pp. ccxlii. & ccxliii. *B. matutella*, Clem. (?): transformations described; V. T. Chambers, l. c. vi. pp. 8 & 9. *B. tabidella*, H. S. (?), or sp. n. (?), from Samarcand; N. Erschoff, Lep. Turk. p. 106.

Acrolepia granitella, Tr., var. from Brazil (?); P. C. Zeller, Verh. z.-b. Wien, xxiv. p. 442.

Antispila cornifoliella, Clem. There may be another allied species feeding on dogwood in America; V. T. Chambers, l. c. vi. pp. 166 & 167.

Aspidisca splendoriferella, Clem. Description re-produced, with remarks, pp. 149 & 150. *A. ella*, Chamb., re-described, pp. 152 & 153; *id.* l. c.

Zelleria sp. n., from Moncreiffe; F. B. White, Scot. Nat. ii. p. 276.

Gracilaria juglandella, Mann., described; E. L. Ragonot, Ann. Soc. Ent. Fr. (5) iv. p. 592.

Coriscium brongniardellum new to Ireland; W. F. Kirby, Ent. M. M. xi. p. 117.

Coleophora. On species found near Paris, and larva of *C. meliloti* (new to France) described; E. L. Ragonot, Bull. Soc. Ent. Fr. (5) iv. pp. clxxxvii. & clxxxviii.

Cosmopteryx scribaiella has been bred from reeds by H. Frey; H. T. Stainton, Ent. M. M. xi. pp. 18 & 19.

Heydenia (Asychna) profugella bred from gentian; *id.* Ent. Ann. 1874, p. 163.

Elachista prætaturella, Clem.; V. T. Chambers, l. c. vi. pp. 76 & 77.

New genera and species.

Millieria, E. L. Ragonot, Bull. Soc. Ent. Fr. (5) iv. p. clxxiii. Type, *Choreutes dolosana*, H. S.

Heliosibes (Atychidæ ?), P. C. Zeller, Verh. z.-b. Wien, xxiv. p. 434. Type, *H. mathewi*, sp. n., l. c. p. 435, pl. xii. figs. 4a & b, Valparaiso.

Guénéa [Guænae], P. Millière, R. Z. (3) ii. p. 245. Allied to *Tinea* and *Bucculatrix*; type, *G. borreonella*, sp. n., l. c., St. Martin, Lantosque.

Sinoe, V. T. Chambers, Canad. Ent. v. p. 231. Allied to *Gelechia*; type, *S. fusco-pallidella*, sp. n., l. c., Kentucky.

Taygete, *id.* *ibid.* Type, *Gelechia difficilisella*, Chamb.

Harpalyce, *id.* l. c. vi. p. 234. Allied to *Hagno (Gelechiidæ)*, but with Tortriciform affinities; types, *H. tortricella*, *albella*, and *canusella*, spp. nn., l. c. p. 235, Texas.

Neda, *id.* l. c. p. 243. Allied to *Anarsia* and *Cleodora*; type, *N. pluteella*, sp. n., l. c. p. 244, Texas.

Polyhymno (Gelechiidæ), *id.* l. c. p. 246. Type, *P. luteo-strigella*, sp. n.,

p. 247; *P. (?) sexstrigella*, sp. n., p. 248, referred here with doubt: both from Texas.

Bryophaga, E. L. Ragonot, Ann. Soc. Ent. Fr. (5) iv. p. 586. Allied to *Blastobasis* and *Butalis*; to contain *Tinea acanthella*, Godt. (re-described and figured, l. c. p. 590, pl. xi. figs. 5, 5a & b), *desidella*, Led., *inertella*, Zell., and *B. triangulella*, sp. n., l. c. p. 589, pl. xi. fig. 4, Corsica.

Philonome, V. T. Chambers, l. c. vi. p. 96. Type, *P. clemensella*, sp. n., l. c. p. 97, Kentucky.

Dryope, id. l. c. p. 49. Allied to *Chauliodus*; type, *D. murtfeldtella*, sp. n., l. c. p. 50, Kentucky, St. Louis.

Cenoe, id. l. c. p. 50. Allied to *Hybroma*; type, *C. hybromella*, sp. n., l. c. p. 51, Kentucky.

Perimede, id. l. c. p. 51. Allied to *Stilbosis* and *Laverna*; type, *P. erransella*, sp. n., l. c. p. 52, Kentucky.

Chrysopelia (spelt *Chrysopeleia*, but corrected on next page), id. l. c. p. 72. Allied to *Laverna*; type, *C. purpuriella*, sp. n., l. c. p. 73, Kentucky.

Æœa, id. l. c. p. 73. Allied to last; type, *Æ. ostryæella*, sp. n., l. c. p. 74, Kentucky.

Theisoa, id. l. c. p. 75. Allied to *Elachista*; type, *T. bifasciella*, sp. n., l. c. p. 76, Kentucky.

Atychia minutula, N. Erschoff, Lep. Turk. p. 96, pl. vi. fig. 105, Sarafshan.

Ochsenheimeria hederarum, P. Millière, l. c. p. 249, Cannes.

Lypusa (?) fulvipennella, O. Hofmann, S. E. Z. xxxv. p. 318, Teinach, Black Forest.

Amadria (?) clemensella, V. T. Chambers, l. c. vi. p. 232, Texas.

Tinea colonella and *longipennis*, Samarcand, *T. (?) cærulipennis*, Sarafshan, N. Erschoff, l. c. p. 97, pl. vi. figs. 106-108; *T. obsкуроstrigella*, V. T. Chambers, l. c. p. 232, Texas.

Tineola macropodella, N. Erschoff, l. c. p. 98, pl. vi. fig. 109, Samarcand; *T. bipunctella*, E. L. Ragonot, Bull. & Ann. Soc. Ent. Fr. (5) iv. pp. clxxi. & 579, pl. xi. fig. 1, Spain, Algeria.

Nemotois auricellus, id. (? = *inauratellus*, Pey., nec Dup.; ? = *prodigellus*, Hein., nec Zell.), ll. cc. pp. clxxii., 331 & 580, pl. xi. figs. 2 & 2a, France, Germany, Switzerland.

Anesychia multipunctella and *mirusella*, V. T. Chambers, l. c. vi. p. 233, Texas.

Psecadia distigmatella, N. Erschoff, l. c. p. 100, pl. vi. fig. 111, Samarcand.

Depressaria homochroella, Samarcand, Turkestan, and *despoliatella*, Samarcand, id. l. c. pp. 100 & 101, pl. vi. figs. 112 & 113; *D. brunneella*, E. L. Ragonot, ll. cc. pp. clxxii., 585, pl. xi. fig. 3, Lardy; *D. chambersella*, M. E. Murtfeldt, Canad. Ent. vi. p. 222, Kirkwood, Mo. (not described).

Cryptolechia ochracea, *fasciatipedella*, *luridella*, *fenestella*, and *ustimacula*, P. C. Zeller, l. c. pp. 436-440, pl. xii. figs. 6-10, Valparaiso.

Gelechia thoracealbella and *minimaculella*, p. 235, *ochreosuffusella* and

depressostrigella, p. 236, *pallidagriseella*, *quadrimaculella*, *wacoella*, *crescentifasciella* and *pullusella*, p. 237, *plutella*, *sella*, and *trimaculella*, p. 238, *elegantella*, p. 239, *rufusella*, *costarufuella*, and *subrubrella*, p. 240, *maculimarginella*, *argentialbella*, and *bidiscomaculella*, p. 241, *subalbuseella*, *parvipulvella*, *lavernella*, and *ciliolineella*, p. 242, *minimella*, p. 243, V. T. Chambers, *l. c.* vi. Texas; *G. placidella*, P. C. Zeller, *l. c.* p. 441, pl. xii. fig. 11, Vancouver's Island; *G. rubensella*, M. E. Murtfeldt, *l. c.* p. 222, Missouri.

Bryotropha glebicolorella, N. Erschoff, *l. c.* p. 101, pl. vi. fig. 114, Samarcand; *B. solanella*, J. A. Boisdual, JB. Soc. Centr. Hort., Nov. 1874, injurious to potatoes in Algeria.

Anacamptis (Gelechia) obliquella, E. L. Ragonot, *ll. cc.* pl. clxxi., 586, Lardy.

Ceratophora radiosella, N. Erschoff, *l. c.* p. 102, pl. vi. fig. 115, Taschkend.

Cladodes (?) biarcataella, id. *l. c.* p. 102, pl. vi. fig. 116, Kisil-kum.

Cleodora pallidastrigella and *pallidella*, V. T. Chambers, *l. c.* pp. 244 & 245, Texas.

Anarsia suffusella and *trimaculella*, id. *l. c.* p. 243, Texas.

Megacraspedus exoletellus, N. Erschoff, *l. c.* p. 103, pl. vi. fig. 117, Sarafschan.

Nothris griseella, V. T. Chambers, *l. c.* p. 245, Texas.

Holocera clemensella, id. *l. c.* p. 246, Texas.

Ecophora bisinuella, N. Erschoff, *l. c.* p. 103, pl. vi. fig. 118, Turkestan.

Butalis capitalis, id. *l. c.* p. 105, pl. vi. fig. 120, Sarafschan; *B. trianguella*, E. L. Ragonot, Bull. Soc. Ent. Fr. (5) iv. p. clxxii., France.

Acrolepia exsuccella, N. Erschoff, *l. c.* p. 98, pl. vi. fig. 110, Sarafschan.

Antispila viticordifoliella and *ampelopsifoliella*, p. 168, *hydrangæella*, p. 170, and *ampelopsicella*, p. 197, V. T. Chambers, *l. c.* Kentucky.

Aspidisca juglandiella and *saliciella*, p. 151, *diespyriella*, p. 217, Kentucky, id. *l. c.*

Argyresthia undulatella and *apicimaculella*, id. *l. c.* pp. 10 & 11, Kentucky.

Ornix fragariæ (Sang, MS.), H. T. Stainton, Ent. Ann. 1874, p. 161, Darlington.

Coleophora zelleriella, *argentialbella*, *ænusella*, p. 128, *fagicorticella*, *unicolorella*, *ciliæochrella*, *rufoluteella*, p. 129, *lineapulvella*, p. 136, Kentucky, *gigantella* and *auropurpurella*, pp. 128 & 136, Canada?, V. T. Chambers, *l. c.*; *C. pulmonariella*, France, Germany, and *giraudi*, Valley of Bourg d'Oisans, E. L. Ragonot, Bull. & Ann. Soc. Ent. Fr. pp. clxxi., cclxi., 593 & 596, pl. xi. figs. 7, 6 & 6a; *C. obtusella* (Moncreaff, MS.) H. T. Stainton, *l. c.* p. 162, Portsmouth [= *C. maritimella*, Newm.]; *C. infibulatella*, O. Hoffmann, *l. c.* p. 318, Stuttgart.

Laverna (?) tetrazonella, N. Erschoff, *l. c.* p. 105, pl. vi. fig. 119, Samarcand.

Tischeria aurifrontella, E. L. Ragonot, *ll. c.* pp. cclxii. 604, pl. xi. fig. 10, France.

Lithocolletis pseudoplatanella and *geniculella*, id. *ll. c.* pp. clxxiii., 600 & 601, pl. xi. figs. 8 & 9, France.

Bucculatrix albipennella, O. Hoffmann, *l. c.* p. 319, Tübingen.

PTEROPHORIDÆ.

Mimæseoptilus aridus. Natural history; W. Buckler, Ent. M. M. x. p. 182.

Edematophorus cretidactylus, Fitch, re-described from Vancouver's Island; P. C. Zeller, Verh. z.-b. Wien, xxiv. p. 444.

Platyptilia brevipennis, sp. n., P. C. Zeller, *l. c.* p. 442, pl. xii. fig. 12, Payta, N. Peru.

Pterophorus pergracilidactylus (= *cinereodactylus*, Fitch; cf. Packard, Rep. Peab. Ac. vi. p. 88), p. 265, *sulphureodactylus* and *cervinidactylus*, p. 266, A. S. Packard, Ann. Lyc. N. York, x., California: spp. nn.

Lioptilus hololeucos [-cus], Valparaiso, *mathewianus*, pl. xii. fig. 13, Vancouver, P. C. Zeller, Verh. z.-b. Wien, xxiv., p. 445: spp. nn.

Aciptilia alternaria, sp. n., id. *l. c.* p. 447, pl. xii. fig. 14, Valparaiso.

DIPTERA.

BY

E. C. RYE, F.Z.S.

THE GENERAL SUBJECT.

GLOVER, TOWNEND. Manuscript Notes from my Journal, or Illustrations of Insects, Native and Foreign. Diptera, or Two-winged Flies. Washington, D.C.: 1874, 4to, pp. i.-iii. pls. i.-xii., & A (each with a page of explanation), pp. 1-120.

This work has not been published, only 45 copies having been taken off for gratuitous distribution. It is lithographed (on one side of the page only) in facsimile, and contains figures of about 340 perfect insects, 160 earlier stages, 30 habitations, details of about 400 species, and (pl. A) anatomical details of 86 genera. Alphabetical lists are given of families and genera mentioned, with synonyms, habitat, food, &c.; of predaceous or parasitic species; vegetable or animal substances attacked; insects destroyed by or destroying *Diptera*, &c. See Canad. Ent. vi. p. 260; Psyche, i. p. 36.

WALKER, F. Notes on Diptera and Lists of Species. First Series. London: 1874, 8vo, pp. 1-37.

A catalogue of names, *Pulicidæ*—*Rhyphidæ*. The 'Notes' consist of five observations, referring chiefly to the views of other authors. If intended to be of use as the commencement of a general catalogue of *Diptera*, references to descriptions should have been added. "The two-winged fly"—"is included in 48 families," which are mentioned in the introductory remarks.

The same author, Ent. vii. pp. 36, 100, 126, 147, 196, 219, *et seqq.*, under the title "Notes on the Wing-bones of the Two-winged Flies," prints 'from the MSS. of A. H. Haliday' observations on the scheme of wing neurulation in the *Diptera*, and gives figures of the wing in various genera (*Diadocidia*—*Hirmoneura*) from Haliday's drawings, adding some general remarks. He also publishes a few vague observations under the heading "The Families of Diptera."—"Family 1, *Pulicidæ*; 2, *Mycetophilidæ*"; Canad. Ent. vi. pp. 11 & 12.

WULP, F. M. VAN DER. Dipterologische Aanteekeningen. No. 4. Tijdschr. Ent. xvii. [ser. 2, ix.] pp. 102-148, pl. viii.

Continued from vol. vi. (ser. 2) of the same work [Zool. Rec. viii. p. 386]. Discusses the Dutch *Cecidomyidæ*, *Mycetophilidæ*, *Bibionidæ*, *Chironomidæ*, and *Tipulidæ*. New genera and species are characterized.

Notes on Scotch Diptera (*Empis bilineata*, Lw., *Hilara nitidula*, Zett., *Nemotelus notatus*, Zett., *Phyllodromia vocatoria*, Fall., *Sympycnus nigritibialis*, Zett., and *Spilomyia fallax*, L., new to Britain); G. H. Verrall, Scot. Nat. ii. pp. 199-202. W. A. Vice, *tom. cit.* pp. 274-276.

Tipula truncorum, Meig., *Echinomyia aenea*, Stäg., *Cynomyia alpina*, Zett. (? = *C. mortuorum*, L.), and *Calliphora greenlandica*, Z., recorded from East Greenland; A. Gerstäcker, in "Die zweite Deutsche Nordpolarfahrt," ii. pp. 405 & 406 (notes by A. Pansch).

Canadian species. Stray notes by B. R. Morris; Canad. Ent. vi. pp. 176-178.

Notes on ordinary noxious American *Diptera*, with remedies; T. Glover, Rep. Comm. Agric. 1872, pp. 123-138, figs. 9-26.

Colorado. Report on *Diptera* collected by W. L. Carpenter in 1873; C. R. Osten-Sacken, in Hayden's Ann. Rep. of U. S. Geol. & Geogr. Survey of the Territories for 1873, Washington: 1874, pp. 561-564 (one new genus). Nearly all the species identified are already known from British N. America.

Larvæ of flies in living human body; Portchinsky, Bull. Ent. Ross. x. p. xiv. In pustules on the skin of a child; Nat. Canad. vi. pp. 264-266.

Flies parasitic on man; W. W. Spicer, Sci. Goss. 1874, pp. 32-35, figs. 27-31.

Parasites on aculeate *Hymenoptera*. *Anthomyia inanis*, Fall., and *Phora pulicaria*, Fall., on *Vespa germanica*; *Meigenia bombivora*, V. d. W., on *Bombus agrorum*; *Zodion cinereum*, F., on *Hylæus 4-strigatus*; and ?

Physocephala pusilla, Meig., on *Bombus lapidarius*; the *Conopidæ* probably lay their eggs in larvæ or pupæ, and do not attack perfect insects. C. Ritsema, Pet. Nouv. vi. p. 367.

Metamorphosis. Weissman's observations on the development of flies translated; Am. Nat. viii. pp. 603-612, 661-667; 713-721. The two modes exemplified by *Corethra* and *Musca*, are sharply distinguished by the presence or absence of true imaginal discs; and the author therefore suggests dividing insects having a metamorphosis into *Insecta discota* and *adiscota*.

CECIDOMYIDÆ.

General observations on economy, &c.; F. M. van der Wulp, Tijdschr. Ent. xvii. pp. 108-112.

Cecidomyia ? *millefolii*, H. Löw, fig. 3, *C. stachydis*, Bremi, fig. 8, and *Diplosis centralis*, Winn., new to Austria; observations on known Austrian species; descriptions of larvæ of species not yet known; and observations on galls; F. Löw, Verh. z.-b. Wien, xxiv. pp. 151-162, pl. ii. *C. albipennis*, Winn., = *saliciperda*, Duf.; *id. l. c.* p. 324. The economy of most of the species mentioned is noted.

Maistor. An exhaustive discussion of the evolution of the larva by F. Meinert, Nat. Tids. (3) viii. pp. 345-377, pl. xii. figs. 1-22. The opinions of Wagner, Pagenstecher, Leuckart, and Meczniokoff are compared, and an abstract (in Latin, incapable of being condensed) is given, pp. 377 & 378.

Asphondylia monacha, O. S.; a fresh ♂ caught on *Solidago*, in June, and queried as hibernating, or belonging to a second brood. C. R. Osten-Sacken, Tr. Am. Ent. Soc. iii. (1871) p. 347.

Cecidomyia resinicola, ♂, ♀, larva, pupa, and gall, on *Pinus inops*, pp. 345 & 346, *cerasi-serotinae*, gall only, p. 346, *id. l. c.* New York. *C. subulifex*, G. Mayr, Verh. z.-b. Wien, xxiv. p. 61, Austria; *C. trifolii*, p. 143, fig. 4, *hieracii*, pp. 145 & 321, fig. 6, *carpini*, p. 322, Austria; F. Löw, *tom. cit.* pl. ii.: spp. nn.

Colpodia pallidula, sp. n., V. d. Wulp, *l. c.* p. 113, pl. viii. fig. 1, Holland.

Epidosis flavescens, F. Löw, *l. c.* p. 147, Austria; *E. nitida*, V. d. Wulp, *l. c.* p. 113, Holland: spp. nn.

Catocha crassitarsis, sp. n., V. d. Wulp, *l. c.* pl. viii. figs. 2 & 3, Rotterdam.

Asynapta longipennis and *griseipennis*, spp. nn., F. Löw, *l. c.* p. 148, Austria.

Lasioptera carophila, sp. n., *id. l. c.* p. 149, pl. ii. fig. 7, Austria.

Asphondylia pimpinellæ, sp. n., *id. l. c.* p. 326, Austria.

MYCETOPHILIDÆ.

General observations on the economy, &c., of the Dutch species; Van der Wulp, Tijdschr. Ent. xvii. pp. 114-124.

F. Walker, Canad. Ent. vi. pp. 12, 111-114, translates Winnertz's Synopsis of the European sub-families and genera.

Mycetophila caudata, Stäg., p. 347, figs. 6 & 7, *rufescens*, Zett., p. 348, fig. 8, described from Austrian specimens; J. Mik, Verh. z.-b. Wien, xxiv. pl. vii.

Mycetobia persicæ figured in its chief stages; T. Glover, Rep. Comm. Agric. 1872, p. 114, fig. 4.

Sciara. Collections of larvæ forming a string, resembling a snake, noticed in Virginia; *id. l. c.* p. 115, fig. 5.

Paratinia, g. n., J. Mik, Verh. z.-b. Wien, xxiv. p. 333. Very like *Polylepta*; wings hairy, with the characteristic cell trapezoidal, inordinately long, &c. *P. sciarina*, sp. n., *id. l. c.* p. 331, pl. vii. figs. 3-5, Austria.

Diadocidia valida, sp. n., *id. l. c.* p. 329, pl. vii. fig. 1, Austria.

Ezechia rufithorax, sp. n., V. d. Wulp, *l. c.* p. 124, pl. viii. fig. 4, Holland.

Brachycampta ruficauda, sp. n., *id. l. c.* p. 125, pl. viii. figs. 6 & 7, Holland.

Mycetophila sordida, sp. n., *id. l. c.* p. 125, pl. viii. fig. 8, Amsterdam.

Platyura concolor, sp. n., *id. l. c.* p. 126, Holland.

CHIRONOMIDÆ.

Chironomus (3 spp.) and *Tanytus* sp.; larvæ found in the depths of Lake Leman. The classification of these insects should be above all based on larval characters, which are more marked than the adult. D. Monnier, Bull. Soc. Vaud. (2) xiii. p. 60.

General observations on the economy, &c., of the Dutch species; V. d. Wulp, Tijdschr. Ent. xvii. pp. 127-137, who describes the following new genera and species:—

Cricotopus, p. 132, for *Chironomus tibialis*, *bicinctus*, *3-cinctus*, *annulipes*, *oscillator*, and *ornatus*, Meig., *motitator*, L., *unifasciatus*, Mcq., and *sylvestris*, F.

Orthocladius, *ibid.*, for *Chironomus stercorarius*, Dej., *dilitatus* (*nigri-ventris*), V. d. W., *pygmæus*, *thoracicus*, and *ictericus*, Meig., *sordidellus* and ? *lucens*, Zett., and *O. diversus*, p. 139, *nanulus*, p. 140, and *albinervis*, p. 141, Holland.

Camptocladius, p. 133, for *Chironomus byssinus*, Schr., *aterrimus* and *minimus*, Meig.

Tanytarsus, p. 134, for *Ch. punctipes*, Wied., *abdominalis*, Stg., *flavipes*, *pusio*, *tenuis*, *junci*, and *albipes*, Meig., *sylvaticus* and *signatus*, V. d. W., *gmundensis*, Egg., *flavellus*, Zett., and *T. sordens*, p. 141, pl. viii. fig. 9 the Hague.

Eurycnemus, p. 135, for *Ch. elegans*, Meig. (*crassipes*, Pz., *æstivus*, Curt., and *hirtipes*, Mcq.).

Metricnemus, p. 136, for *Ch. albo-lineatus*, *fuscipes*, *nanus*, and *pallidulus*, Meig., *incomptus*, Zett., and *M. ochraceus*, p. 142, Utrecht.

Corynoneura pumila, p. 137, the Hague.

Chironomus 3-color and *3-notatus*, p. 138, Holland.

Tanytus guttipennis, p. 142, pl. viii. fig. 11, *rufo-vittatus*, p. 143, *ele-gantulus* and *pygmæus*, p. 144, Holland.

BLEPHAROCERIDÆ.

Bibiocephala, g. n., C. R. Osten-Sacken, in Hayden's Report [*suprà*], p. 564, fig. Closely allied to *Blepharocera*, but differing in the venation of wings (an intercalary longitudinal vein between 1st and 2nd veins), shortness of antennæ, and structure of the head. Confirms the relationship between the *Blepharoceridæ* and *Ptychopterina*. *B. grandis*, sp. n., *id. l. c.* p. 566, Colorado Mountains.

CULICIDÆ.

Culex mosquito. A. M. Mayer, Am. J. Sci. (3) viii., pp. 89-103 (reprinted, with corrections, Am. Nat. viii. pp. 577-592, fig. 92), from experiments on the antennæ of the ♂ of this insect, confirms the idea that the antennal fibrils are auditory organs. Cf. also Am. Nat. viii. p. 236.

A very strong infusion of roots of *Triticum repens* is successfully used at Simbirsk as a preventative against attacks of mosquitoes, &c.; Bull. Ent. Ross. x. p. 10.

TIPULIDÆ.

Observations on the synonymy, &c., of Dutch species; V. d. Wulp, Tijdschr. Ent. xvii. pp. 145-148.

Tipula oleracea. A minute illustrated account of the anatomical structure of the mouth of the crane fly; A. Hammond, Sci. Goss. 1874, p. 155-160, figs. 97-112.

Dolichopeza opaca, Mik, = *sylyicola*, Curt.; *D. sylyicola*, Mik, *nec* Curt., is described as *nitida*, sp. n.; and observations on the synonymy are made: J. Mik, Verh. z.-b. Wien, xxiv. pp. 350-363. *Pachyrhina aurantiaca*, Mik, *nec* Macq., is re-named *euchroma*; *id. l. c.* p. 353.

Eutonia, g. n., V. d. Wulp, *l. c.* p. 147. Allied to *Pæcilostola*. Type, *Limnobia barbipes*, Meig. (wing, and that of *P. angustipennis*, Meig., figured, pl. viii. figs. 11 & 12).

Tipula senex, sp. n., (A. White) A. G. Butler, Zoology of Voyage of Erebus & Terror, ii. p. 27, pl. vii. fig. 15, New Zealand.

STRATIOMYIDÆ.

Diphysa apicalis, sp. n., (A. White) *id. l. c.* pl. vii. fig. 17, New Zealand.

XYLOPHAGIDÆ.

Rhachicercus nigripalpis, sp. n., H. Loew, B. E. Z. xviii. p. 378, Mexico.

LEPTIDÆ.

A list of the species known in N. America; C. R. Osten-Sacken, Bull. Buff. Soc. ii. pp. 171-174 (47 spp., 6 genera).

Atherix ibis swarming; H. Tournier & A. de Borre, CR. Ent. Belg. 1874, p. lxxxix.-xci. 2 figs.

Chrysopila humilis, sp. n., H. Loew, l. c. p. 379, San Francisco.

Triptotricha (re-characterized, and attributed to a section *Psammycterina*, p. 381) *discolor*, p. 379, San Francisco, *fasciventris*, p. 380, Pennsylvania, *id. l. c.*, spp. nn.

THEREVIDÆ.

Thereva hirticeps, sp. n., *id. l. c.* p. 382, San Francisco.

MYDASIDÆ.

A list of the species known in N. America; C. R. Osten-Sacken, Bull. Buff. Soc. ii. pp. 174 & 175 (28 spp., 2 genera).

Mydas audax, Kentucky, *carbonifer*, Cayuga Lake, p. 186, *chrysostomus*, p. 187, N. Texas, spp. nn., *id. l. c.*

ASILIDÆ.

A list of the *Dasypogonina* of N. America; *id. l. c.* pp. 176-185 (141 spp., 28 genera).

Stenopogon gratus and *univittatus*, Lw., are sexes of one species; *Cyrtopogon melanopleurus*, Lw., = *Evarmostus bimacula*, Walk., ♀, but *Evarmostus* cannot stand generically; *Dasypogon 6-fasciatus*, Say, is a *Laphystia*: H. Loew, B. E. Z. xviii. pp. 358, 365, & 373. As regards North American species, *Lasiopogon*, Lw., is re-named *Daulopogon*; *Heteropogon*, Lw., re-named *Anisopogon*; *Ablautus*, Lw., altered to *Ablautatus*; *Archilestes*, Schin., to *Archilestris*; *Blax* to *Blacodes*; *Holcocephala*, Jaenicke, is accepted for *Discocephala*, Macq.: *id. l. c.* p. 377.

Psilocurus, g. n., *id. l. c.* p. 373. Differs from *Laphyctis* chiefly in having two strong setæ at the hinder margin of the scutellum, the 3rd antennal joint roundish oval, &c. *P. nudiusculus*, sp. n., *id. l. c.* p. 370, Texas.

Leptogaster eudicranus, sp. n., *id. l. c.* p. 353, Texas.

Ospricerus eutrophus, sp. n., *id. l. c.* p. 355, Texas.

Scleropogon helvolus, sp. n., *id. ibid.* Texas.

Stenopogon morosus, sp. n., *id. l. c.* p. 356, Sierra Nevada.

Cyrtopogon callipedilus, p. 358, *montanus*, p. 362, *leucozonus*, p. 364, Sierra Nevada, *longimanus*, p. 360, San Francisco, *id. l. c.*, spp. nn.

Holopogon phæonotus, sp. n., *id. l. c.* p. 366, Texas.

Lasiopogon opaculus, p. 367, Illinois, *tetragrammus*, p. 368, Canada, spp. nn., *id. l. c.*

Saropogon combustus, p. 373, *adustus*, p. 375, spp. nn., *id. l. c.* Texas.

Laphria consimilis, sp. n., J. G. Wood, "Insects Abroad," p. 758, fig. 501, Natal.

DOLICHOPODIDÆ.

Chrysotus. Monograph of the genus; F. Kowarz, Verh. z.-b. Wien, xxiv. pp. 453-478, pl. xiii. *C. neglectus*, figs. 1-5, *læsus*, figs. 6-14, *cilipes*,

figs. 18–20, *femoratus*, fig. 22, *Nematoproctus distendens*, figs. 23–28, *Diaphorus oculatus*, figs. 29–33, *Asyndetus latifrons*, fig. 34, figured in detail. Tables of the species, ♂ & ♀, are given. Doubtful species are referred to, pp. 475 & 476.

Machærium maritimæ, Hal.; economy observed by J. Brown, Ent. vii. p. 207. Earthen cocoons from Weymouth noted; F. Smith, P. E. Soc. 1874, p. xix.

Sphyrrotarsus, g. n., J. Mik, Verh. z.-b. Wien, xxiv. p. 342. Claws entirely without pulvilli, and with a broad, short, triangular, scoop-shaped empodium. *S. argyrostomus*, sp. n., *id. l. c.* p. 337, pl. vii. figs. 10–16, Austria.

Telmaturgus, g. n., *id. l. c.*, p. 349. Allied to *Sympycnus* and *Synarthrus*, Lw. Type, *Sympycnus tumidulus*, Radd., pl. vii. figs. 18–24.

Chrysotus pulchellus, p. 461, Austria, Germany, fig. 15, *blepharosecles*, p. 462, fig. 21, Austria, Lyons, *monochætus*, p. 468, Galicia, *microcerus*, p. 469, fig. 17, Germany, *varians*, p. 471, Tatra Mts., *angulicornis*, p. 474, fig. 16, Germany; Kowarz, *l. c.* pl. xiii., spp. nn.

Hydrophorus rogenhoferi, sp. n., J. Mik, *l. c.* p. 334, pl. vii. fig. 9, Austria.

SYRPHIDÆ.

Species of the Dee district (Scotland) enumerated; W. A. Vice, Scot. Nat. ii. pp. 203 & 204.

Eristalis tenax and *Syrphus clypeatus* clearly proved to eat pollen of flowers; A. W. Bennett, J. R. Hort. Soc. (n. s.) iv. p. 158; Ent. vii. p. 135.

Volucella bombylans. Notes on its development, with special observations on the development of the tubular head appendages of its pupa; E. A. Ormerod, Ent. M. M. x. pp. 196–200, figs. 1–7.

CONOPIDÆ.

Zodion cinereum, Germ., parasitic on *Hylæus 4-strigatus*, Latr., and observations on the economy of *Conops*; C. Ritsema, Tijdschr. Ent. xvii. Versl. p. lxxviii.; Pet. Nouv. vi. p. 367.

MUSCIDÆ.

General observations on *Tachinides* by F. Walker, with a list of some European species and the insects on which they are known to be parasitic; Cist. Ent. pt. x. pp. 279–283.

Rutilia and allies discussed, the generic characters of it and of *Amphibolia*, *Ptylostylum*, *Graphostylum*, and *Diaphania* (which should be retained), Macq., *Amenia*, Desv., and *Formosia*, Guér., being tabulated, and a synonymic catalogue of the species given. *Formosia moneta*, Gerst., figured. J. M. Bigot, Ann. Soc. Ent. Fr. (5) iv. pp. 451–460, pl. viii. fig. 5.

Musca domestica, L. Transformations fully described; the American species is the same as the European (Harris's *M. domestica* is probably

M. harpyia). The entire period of development is from 10 to 14 days in August, and there are 3 stages of the larval state. The puparium is attacked by a Dermestid larva. *Calliphora vomitoria*, *Sarcophaga carnaria*, and *Stomoxys calcitrans*, incidentally discussed. A. S. Packard, Jr., P. Bost. Soc. xvi. pp. 136-150, pl. iii.

Phytomyza geniculata, Macq., injurious in the larval state to Synanthraceous plants; Bull. Soc. Ent. Fr. (5) iv. p. cxxviii.

C. Rondani, Bull. Ent. Ital. vi. pp. 167-182, analytically describes the Italian species of *Tanypezides*, and *l. c.* pp. 243-274, those of his group *Loncheides*, *Chyromyia*, Desv., = *Thyrinyza*, Zett., being removed to the latter from the *Agromyzides*.

The position of the group *Diopsidides* criticized, and its separate value maintained. It contains *Plagiocephala*, Macq., *Achias*, Bosc, *Anæropsis*, Bigot, *Sphyrocephala*, Say, and *Diopsis*, L., a list of the known species of the last genus being given, with localities. J. M. Bigot, *l. c.* pp. 107-110.

The European and exotic genera of *Ephydrides* grouped, and the genus *Canace*, Hal., exhaustively discussed; H. Loew, B. E. Z. xviii. pp. 76-79.

New genera and species:—

Meroplus, Rondani, *l. c.* pp. 170 & 175. *Tanypezides*; type, *Nemopoda stercoraria*, Macq., and *M. melitensis* and *schembrii*, *l. c.* pp. 175 & 176, Malta; also *Sepsis falleni* and *lucidus*, Stäg.

Sephanilla, Rondani, *l. c.* p. 267 (*Loncheides*, Rond.). Transverse intermediate nervure somewhat near the basal, and far from the outer nervure. *S. sertulata*, *id. l. c.* p. 268, Parma.

Echinomyia albanica, J. M. Bigot, *l. c.* p. 116, Albania.

Pachystylum letochai [-chæ], J. Mik, Verh. z.-b. Wien, xxiv. p. 343, pl. vii. figs. 25 & 26, Austria.

Formosia variegata, p. 461, fig. 4, Australia, *smaragdifera*, p. 462, fig. 3, Batchian, *velutina*, p. 463, fig. 2, Van Diemen's Land; J. M. Bigot, *l. c.* pl. viii.

Rutilia argentifera, p. 464, fig. 6, Sydney, *fulviventris*, p. 465, fig. 1, Van Diemen's Land, *echinom[yio]ides*, p. 466, Australia, *id. l. c.* pl. viii.

Sarcophaga sarraceniz, bred in N. America, in *Sarracenia variolaris*, a carnivorous plant, the larva feeding on putrid insect remains. General observations, and all stages figured. C. V. Riley, Sci. Goss. 1874, pp. 274 & 275, fig. 182; Canad. Ent. vi. p. 209, fig. 26 [?] = *S. carnaria*, L., var., teste Riley, Ann. Rep. Miss. vii. 1875, p. 181].

Idia tripartita, E. India, *tricolor*, locality unknown, p. 236, *nigricauda*, p. 237, Burmah, *4-notata*, Borneo, *cincta*, Ceylon, p. 238, J. M. Bigot, *l. c.*

Rhinia fulvipes, Ceylon, *cribrata*, Sierra Leone, *id. l. c.* p. 239.

Cosmina laticincta, p. 240, Natal, *micans* and *pinangiana*, p. 241, Pulo Penang, *id. l. c.*

Rhynchomyia cuprea, p. 241, Spain, *tigrina*, p. 242, Australia, *id. l. c.*

Ochthiphila frontella, p. 260, *obscuripes*, p. 261, Rondani, *l. c.* Parma.

Leucopis talaria, p. 264, *minuscula*, p. 265, *palliditarsis*, *armillata*, p. 266, *ballestrerii*, p. 267, *id. l. c.* Italy.

Acrosticta dichroa, H. Loew, B. E. Z. xviii. p. 304, San Francisco.

- Palloptera limbata*, Rondani, *l. c.* p. 257, Piedmont Alps.
Lonchea scutellaris, *id. l. c.* p. 271, Parma.
Diopsis dubia, Natal, *fallax*, Borneo, p. 111, *argentifera*, p. 112, Celebes, *belzebuth*, p. 113, *villosa*, p. 114, Borneo, *D.* (? *Sphyrocephala*) *cothurnata*, p. 115, Celebes, Bigot, *l. c.*
Saltella parmensis, Parma and Piedmont, p. 179, *nigerrima*, p. 180, Parma, Rondani, *l. c.*
Piophila melanocera, *id. l. c.* p. 249, Parma.
Canace ranula, H. Loew, *l. c.* p. 81, Coasts of England and N. Germany.
Thyrimyza macrura, Rondani, *l. c.* p. 247, N. and Central Italy.
Geomyza pictipennis, p. 252, *calceata* and *bracata*, p. 253, Parma, *id. l. c.*

CESTEIDÆ.

Cuterebra sp. (? *ephippium*); larva found in a large tumour on *Didelphis murina*, from Guiana. Girard, Bull. Soc. L. N. Fr. vi. No. 3.

(APHANIPTERA.)

Pulex obtusiceps, Rits., = *talpæ*, Curt.; T. J. Bold, Ent. M. M. x. p. 228. *P. terrestris*, Macq., and *P. gigas*, Kby., are probably also synonymic with this species; C. Ritsema, Tijdschr. Ent. xvii. Versl. pp. lxxiii.-lxxv.

Dermatophilus, Guér., anterior to *Sarcopsylla*, Westw., is adopted for *Rhynchoprion*, Herm., which was proposed for an Arachnid; A. La-boulbène, Bull. Buff. Soc. Ent. Fr. (5) iv. p. clv.

Platypsyllus castorinus. Westwood, Thesaurus entomologicus oxoniensis, pp. 194 & 195, considers that his Order "*Achreioptera*" must be (provisionally) retained for this insect, in which he has failed to find any trace of mandibles. He figures it, with details, pl. xxxvii. figs. 1 & 2. Leconte's views reproduced, with a figure; Am. Nat. viii. pp. 427 & 428, fig. 82.

NEUROPTERA.

BY

ROBERT McLACHLAN, F.L.S.

THE GENERAL SUBJECT.

GERSTÄCKER, A. Ueber das Vorkommen von Tracheenkiemen bei ausgebildeten Insecten. Z. wiss. Zool. xxiv. pp. 204-252, pl. xxiii.

Abstracted in Z. ges. Naturw. (2) x. pp. 174-178.

More especially concerns the *Perlidae* [infra, p. 456].

MEYER-DÜR, L. R. Die Neuroptern-Fauna der Schweiz, bis auf heutige Erfahrung. MT. schw. ent. Ges. iv. pp. 281-352.

The first part of a list of Swiss Neuroptera, with, in some cases, short descriptions and rather copious local information. The present list enumerates 20 species of *Psocidæ*, 34 *Perlidae*, 37 *Ephemeridæ*, and 60 *Odonata*.

SPAGNOLINI, A. Contribuzioni alla conoscenza della Fauna Entomologica d'Italia. Bull. Ent. Ital. vi. pp. 31-42.

McLACHLAN's Catalogue of the Neuropterous Insects of New Zealand (*cf.* Zool. Rec. x. p. 428) is reprinted in Tr. N. Z. Inst. vi. Appendix, pp. xc.-xcix.

Notes on rare Scottish species in Scot. Nat. ii. p. 203.

TRICHOPTERA.

ALBARDA, HERMAN. Sur deux nouvelles espèces de Trichoptères d'Europe. Tijdschr. Ent. xvii. pp. 229-234, pl. xiv.

McLACHLAN, R. A Monographic Revision and Synopsis of the *Trichoptera* of the European Fauna. Part i. pp. 1-46, pls. i.-v.

The commencement of a general work, in which it is intended to describe all the species, and to figure the more essential characters of

each. This first part consists of an introductory portion, detailing the structure and adopted classification of the group as a whole, with remarks on the position of the *Trichoptera*, which the author is inclined to consider as of ordinal value. The geographical extent of the European Fauna is accepted as nearly equivalent to the Palearctic division of Sclater, *i.e.*, as comprising all Europe, Northern Africa, Northern and Central Asia, Madeira, &c. The whole of the family *Phryganeidae* is completed in part i., and the *Limnophilidae* are commenced.

STEIN, J. P. E. F. Beitrag zur Kenntniss der Phryganeiden des Alt-vaters und einiger anderer. S. E. Z. xxxv. pp. 244-253.

An indication of an insect under the name of '*Phryganea lutea*,' is given by ROUX, Bull. Soc. Sci. Lyon, i. p. 20.

Phryganeidae.

McLACHLAN, in his 'Revision & Synopsis,' has completed the descriptions of the species included in his geographical limits, to the number of 16. No new species are noticed, but the essential characters of most of the known forms are figured, pp. 13-30, pls. ii.-iv.

Limnophilidae.

A preliminary tabular arrangement of the genera of the European Fauna is given by McLachlan in his 'Revision and Synopsis,' pp. 32 & 33; the following genera and species are noticed as new:—

Astratus, p. 32. Allied to *Colpotaulius*, but has the 1st joint of the anterior tarsi in the ♂ longer than the 2nd. Type, *A. asiaticus*, p. 36, pl. iv. Turkestan.

Hemipterna, *ibid.* Allied to *Stenophylax*, but with the 1st joint of the anterior tarsi in the ♂ much shorter than the 2nd. The spur-formula of the ♂ is erroneously given as 1,3·4, it should be 0·3·4, and the genus is not practically distinct from *Micropterna* (Stein, *infra*).

Anisogamus, l. c. Allied to *Stenophylax*, but with the wings differently formed in the sexes. Type, *S. difformis*, McLach.

Apatidea, p. 33. Allied to *Apatania*, but the spur-formula is 1·2·2.

Glyphotellus persicus, p. 45, pl. iv. North Persia.

STEIN, S. E. Z. xxxv., describes the following new genera and species:—

Stenophylax flavospinosus, p. 245, Greece.

Micropterna. Between *Stenophylax* and *Halesus*. Spurs 0·3·3 ♂ (should be 0·3·4); 1st joint of anterior tarsi of ♂ abbreviated. *M. orophila*, p. 247, Harz and Altvater.

Chaetopterygopsis. Allied to *Chaetopteryx*. Spurs, ♂, 0·2·2, ♀, 0·2·2, or 1·2·2. Should be, ♀ 1·3·3. *C. maclachlani*, p. 249, Altvater, &c.

Psilopteryx, formed to receive *Chaetopteryx psorosa*, Kol., p. 250.

Anomalopteryx. Spurs, ♂, 0·2·2, ♀, 1·2·2. Anterior wings of ♂ sub-abrupt, the apex cuspidate; those of ♀ somewhat rounded. *A. chauviniana*, p. 251, Silesia.

Sericostomatidae.

Brachycentrus subnubilus. The males found congregating in a mori-

bund condition on the underside of leaves of *Symphytum officinale* near London. Boyd, P. E. Soc. 1874, p. xi.

Leptoceridæ.

Leptocerus riparius, sp. n., Albarda, Tijdschr. Ent. xvii. p. 231, pl. xiv. figs. 8-17, Holland and Bonn.

Hydropsychidæ.

Nyctiophylax stagnalis, sp. n., *id. l. c.* p. 229, pl. xiv. figs. 1-7, Holland.

NEUROPTERA-PLANIPENNIA.

Osmylidæ.

Psectra diptera. Albarda, in Tijdschr. Ent. xvii. Verslag, pp. xvi.-xix., noticing the occurrence of this rare insect in Holland, summarizes what has previously been written concerning it. He is inclined to consider the examples with rudimentary posterior wings as females.

Mantispidæ.

Trichoscelia. J. O. Westwood, 'Thesaurus entomologicus oxoniensis,' describes and figures: - *T. fumosella*, Westw., p. 176, pl. xxiii. fig. 1, *sequella*, Westw., *l. c.* fig. 2, *fasciatella*, Westw., *l. c.* fig. 3, and *partheniella*, Westw., p. 178, fig. 4.

Nemopteridæ.

Westwood, *l. c.*, figures and describes the following species of *Nemoptera*, in its broad sense [it is surely by an oversight that he still places the genus in the family *Panorpidæ*]: - *N. imperatrix*, Westw., p. 178, pl. xxxiii. fig. 8, *hebraica*, sp. n. [= *egyptiaca*, Ramb., *certe*], *l. c.* fig. 5, *costalis*, Westw., p. 179, fig. 6, *albo-stigma*, sp. n. *l. c.* fig. 7, *Zulu*, *remifera*, sp. n., *l. c.* fig. 9, Cape of Good Hope, *tipularia*, sp. n., *l. c.* fig. 10, Damara Land.

PSEUDO-NEUROPTERA.

THYSANURA.

ANTHONY, JOHN. The scales of *Lepisma* as seen with reflected and transmitted light. M. Micr. J. xi. pp. 193-195, pl. lix.

Relates principally to the appearance of longitudinal lines on the surface between the ribs.

MOREHOUSE's notes on the structure of the scales of *Lepisma saccharina* (cf. Zool. Rec. x. p. 433) are reprinted in M. Micr. J. xi. pp. 13-15.

Podura scales. WENHAM describes a method of dissection for minute microscopic research. M. Micr. J. xi. pp. 75 & 76, woodcut.

Iapyx wollastoni, sp. n., Westwood, Thesaurus ent. oxon., p. 196, pl. xxxvii. fig. 3, Southern Desertas.

MALLOPHAGA.

GIEBEL, C. G. *Insecta Epizoa*. Die auf Säugethieren und Vögeln schmarotzenden Insecten, nach Chr. L. Nitzsch's Nachlass bearbeitet. Leipzig: 1874, fo. pp. 1-308, pls. i.-xx.

Pages 48-308, & pls. iii.-xx., refer to the *Mallophaga*. As the title indicates, the work may be considered as pertaining to Nitzsch posthumously, but with additional species, &c., added by Giebel. At the commencement is a systematic list of birds, with the parasite that pertains to each indicated, and a copious and exhaustive introductory portion, treating upon the bibliography, classification, &c.

The following genera and species are noticed, the latter being mostly figured:—

Philopteridæ.

Trichodectes, with 22 species tabulated, and more or less fully described. Of these the following known species are figured:—*T. exilis*, pl. iii. fig. 6, *latus*, figs. 2 & 3, *retusus*, figs. 3 & 4, *subrostratus*, fig. 5, *longicornis* (*cervi*, Redi), fig. 8, *scalaris* (*bovis*, L.), figs. 7-9.

Philopterus is sub-divided into 5 genera, viz.:—

Docophorus, with 106 species, and about 25 others unknown to the editor. Of these the following known species are figured:—*D. brevicollis*, pl. x. fig. 7, *brevifrons*, pl. xii. fig. 6, *platystoma*, pl. ix. fig. 5, *cursor*, pl. x. figs. 5 & 6, *heterocera*, pl. xii. figs. 1 & 2, *rostratus*, pl. x. fig. 4, *ceblebrachys*, pl. xi. fig. 15, *semisignatus*, pl. xi. figs. 9 & 14, *ocellatus*, pl. ix. figs. 7 & 8, *atratus*, fig. 10, *guttatus*, fig. 4, *crassipes*, fig. 6, *fulvus*, fig. 11, *communis* (*emberizæ*, De Geer, *pyrrhulæ*, *chloridis*, *citrinellæ*, and *rubeculæ*, Schrank), pl. xi. fig. 13, *fuscicollis*, pls. xi. fig. 10, xx. fig. 4, *excisus* (*hirundinis*, Schrck.) pl. xi. figs. 1-3, *leontodon* (*sturni*, Schrck., *pastoris*, Denny), pl. xii. figs. 4 ♂, 7 ♀, *serrilimbus*, pl. ix. fig. 12, *superciliosus*, pl. x. fig. 3, *scalaris*, pl. x. fig. 1 & 2, *tricolor*, pl. x. figs. 9-11, *subincompletus*, pl. xii. fig. 3, *breviloratus*, pl. xii. fig. 5, *sphenophorus* (*platalæ*, Denny), pl. xii. fig. 4, *bisignatus*, pl. ix. fig. 9, *auratus*, pl. xi. figs. 2 & 6, *pertusus*, pl. xi. figs. 3 & 12, *icterodes*, pl. x. fig. 8, *celedoxus*, pl. xi. figs. 1 & 16, *ambiguus*, pl. viii. figs. 12 & 13.

Nirmus, with 139 species, and 16 additional (described by Rudow) noticed; the known species figured are:—*N. discocephalus* (*imperialis*, Giebel), pl. viii. fig. 10, *euzonius*, pl. viii. fig. 1, *fuscus*, pl. viii. fig. 2, *rufus* (*platyrhynchus*, Lyonnet), pl. vii. figs. 11 & 12, *argulus*, pl. xii. figs. 8 & 9, *varius*, pl. vii. fig. 23, *uncinosus*, pl. 7, fig. 1, *olivaceus*, pl. vi. fig. 10, *limbatus*, pl. vii. fig. 6, *cyclothorax*, pl. vi. fig. 9, *trithorax*, pl. vii. fig. 7, *delicatus*, pl. vii. fig. 8, *marginalis*, pl. vi. figs. 6 & 7, *intermedius*, pl. vi. fig. 8, *gracilis*, pl. vii. figs. 11 & 12, *tenuis*, pl. vii. fig. 5, *cephaloxys*, pl. vii. fig. 9, *subcuspidatus*, pl. viii. fig. 3, *hypoleucus*, pl. viii. fig. 5, *cephalotes*, pl. vii. fig. 8a, *marginellus*, pl. vi. fig. 5, *fenestratus*, pl. vi. fig. 4, *asymetricus*, pl. viii. figs. 8 & 9, *cameratus* (*lagopi*, L.), pl. xii. fig. 7, *anchoratus*, pl. viii. fig. 10, *bicuspis*, pl. v. figs. 11 & 12, *holophæus*, pl. v. fig. 1, *schropygus*, pl. v. figs. 5 & 6, *furvus*, pl. v. figs. 2 & 3, *obscurus*, pl. vi. figs. 2 & 3, *cingulatus*, pl. v. fig. 4, *minutus*, pl. v. fig. 7, *attenuatus*, pl. vi.

fig. 1, *phænotus*, pl. iv. figs. 3 & 4, *selliger* (*sternæ*, L., *lari*, De Geer, *stellatus*, Gervais), pl. iv. figs. 9 & 10, *nyctihemerus*, pl. v. fig. 8, *eugrammicus*, pl. iv. figs. 11 & 12, *punctatus*, pl. iv. figs. 1 & 2, *lineolatus*, pl. iv. figs. 5-8, *frontatus*, pl. viii. fig. 11, *stenopygus*, pl. viii. figs. 6 & 7.

Goniocotes has 22 spp., of which the following are figured:—*G. asteroccephalus*, pl. xiii. figs. 3 & 4, *compar*, pls. xii. figs. 10 & 11, & xx. fig. 8, *curtus*, pl. xiii. fig. 2.

Goniodes contains 29 spp., including some imperfectly known; these are figured:—*G. dispar*, pl. xii. figs. 12 & 13, *securiger*, pl. xv. figs. 11 & 12, *falcicornis* (*pavonis*, L., *tetragonocephalus*, Olfers) pl. xii. figs. 14 & 15, *stylifer*, pl. xiii. fig. 1, *dissimilis*, pl. xx. fig. 9, *lipogonus*, pl. xiii. fig. 5.

Lipurus has 102 species, and a few additional ones are noticed but not named. The species figured are:—*L. ætheronomus*, pl. xvii. fig. 8, *ternatus*, pl. xvii. figs. 3 & 4, *quadripustulatus*, pl. xvii. fig. 5, *bacillus* (*columbæ*, L., *filiformis*, Olfers), pls. xvi. figs. 8 & 9, xx. fig. 3, *mesopelius*, pl. xvii. fig. 7, *polytrapezius* (*meleagridis*, L.), pl. xvii. figs. 1 & 2, *variabilis* (*caponis*, L.), pl. xvi. fig. 3, *turmalis*, pl. xvii. fig. 6, *versicolor* (*ciconiæ*, L.), pl. xvi. fig. 7, *hebraeus* (*gruis*, L.), pl. xvi. figs. 5 & 6, *leucopygus* (*ardeacinereæ*, L., *obtusius*, Steph.), pl. xvi. fig. 2, *helvolus*, pl. xvi. figs. 10 & 11, *luridus* (*fulicæ*, Redi), pl. xvi. fig. 4, *fejunos* (*anatis-anseris*, L., *crassicornis*, Olfers, *anseris-sylvestris*, Redi), pl. xx. figs. 5 & 7, *squalidus*, pl. xvi. fig. 1.

Liotheidæ.

Gyropus contains 5 known species, none of which are figured.

Liotheum is divided into *Eureum*, *Læmobothrium*, *Physostomum*, *Trinotum*, *Colpocephalum*, and *Menopon*.

Eureum contains 2 known species, not figured.

Læmobothrium has 13 species, of which *lichtensteini*, pl. xviii. fig. 8, and *atrum* (*fulicæ*, Redi, *nigrum*, Burm.), pl. xviii. fig. 5, are figured.

Physostomum has 9 species; figured are—*mystax*, pl. xviii. figs. 2 & 3, *frenatum*, pl. xviii. fig. 6, *sulphureum* (*dolicocephalus*, Scop., *orioli*, F.), pl. xviii. fig. 4, *irascens*, pl. xviii. fig. 1.

Trinotum is made up of 7 known species, and 2 others noticed, but not named. Those figured are:—*conspurcatum*, pl. xix. fig. 9, *luridum*, pl. xviii. fig. 7, *lituretum*, pl. xviii. fig. 10.

Colpocephalum contains 59 species, of which the following are figured; *C. flavescens*, pls. xiii. fig. 10, xix. figs. 3, 4, & 7, *subæquale*, pl. xiii. figs. 13 & 14, *productum* (*vittatum*, Giebel), pl. xiv. figs. 2 & 3, *inæquale*, pl. xiii. figs. 11 & 12, *appendiculatum*, pl. xiv. figs. 5 & 6, *quadripustulatum*, pl. xiii. fig. 7, *zebra*, pl. xiii. fig. 6, *trochioxum*, pl. xiii. fig. 8, *umbrinum*, pl. xiv. fig. 4, *ochraceum*, pl. xiv. fig. 5, *eucarenum*, pl. xiv. fig. 1.

Menopon has 67 species; of these are figured:—*M. melaleucum* (*cornicis*, De Geer), pls. xiv. figs. 11 & 12, xix. figs. 1-6, *gonophaeum*, pl. xv. fig. 1, *eurysternum* (*piceæ*, L.), pl. xv. fig. 4, *brunneum*, pl. xiv. figs. 9 & 10, *cucullare* (*sturni-candidi*, Redi), pl. xv. fig. 5, *minutum* (*sinuatum*, Burm.), pl. xv. fig. 2, *phanerostigma* (*fasciatus*, Scop.), pl. xiv. fig. 8, *pallidum* (*gallinæ*, L., *capit*, Redi) pls. xvii. fig. 11, xix. figs. 2-5, *ventrale*, pl. xv.

figs. 9 & 10, *lutescens*, pl. xvii. fig. 10, *tridens* (*scopulacorne*, Denny), pl. xvii. fig. 9, *icternum*, pl. xvii. fig. 12, *eurygaster*, pl. xv. fig. 6, *leucozanthum*, pl. xviii. fig. 9.

The following species are described as new :—

Philopteridæ.

Docophorus eurygaster, p. 69, on *Buteo lagopus*; *femoralis*, p. 71, on *Falco leucomelas*, or an allied species; *pachypus*, p. 71, on *Falco pondicerianus*; *obscurus*, p. 72, on *Rosthramus hamatus*; *chelorchynchus*, p. 72, on *Circus aeruginosus*; *spathulatus*, p. 73, on *Milvus ater*; *pictus*, p. 71, on *Aquila chrysaetos*; *pallidus*, p. 78, on *Strix tengmalmi*; *crenulatus*, l. c., on *Strix nisoria*; *virgo*, p. 79, on *Strix superciliaris*; *splendens*, l. c., on *Strix pygmæa*; *trigonophorus* on *Lanius ruficeps*; *bituberculatus*, p. 90, on *Edolius bilobius* (dry skin); *lineatus*, p. 91, on *Arachnothera longirostris* (dry skin); *ovatus*, p. 98, on *Ardea stellaris*; *temporalis*, p. 102, on *Charadrius morinellus*; *frater*, p. 103, on *Totanus hypoleucus*; *furcatus*, p. 106, on *Ibis rubra*; *hians*, p. 107, on *Ibis rubra*; *clausus*, l. c. on *Ibis macei*; *lobaticeps*, p. 109, on *Sterna hirundo* and *fissipes*; *laricola* (Nitzsch), p. 110, on *Sterna leucoparia*; *brevicornis*, p. 112, on *Sterna aculeata* (dry skin); *euryrhynchus*, l. c., on *Lestris pomarinus*; *brevimaculatus*, p. 114, on *Anser albifrons*; *brunneiceps*, l. c., on *Anser cygnoides*; *ferrugineus*, l. c., on *Anas clypeata*; *bipunctatus*, p. 116, on *Mergus merganser*; *hexagonus*, l. c., on *Phaeton phœnicurus*; *coronatus*, l. c., on *Puffinus fuliginosus*; *longisetaceus*, p. 118, on a fresh skin of *Aquila fulva*; *furca*, l. c., on *Grus leucogeranus* (dry skin); *leucogaster*, p. 300, on *Buteo jaktal*; *macropus*, p. 301, on *Caprimulgus europæus*.

Nirmus kunzii, p. 124, on *Falco tinnunculus*; *vittatus*, p. 127, on *Milvus ater*; *socialis*, l. c., on *Circus aeruginosus*, *cineraceus*, and *pygæus*; *stenorhynchus*, p. 129, on *Milvus ætolius*; *brachythorax*, p. 134, on *Bombycilla garrula*; *oxypygus*, p. 135, on *Sturnella pyrrhocephala*; *propinquus*, p. 136, on *Loxia pityopsittacus*; *juno*, p. 137, on *Coccothraustes europæus*; *nivalis*, p. 140, on *Emberiza nivalis*; *fallax*, p. 141, on *Pitta thalassina*; *lais*, p. 143, on *Luscinia lusciola*; *tristis*, l. c., on *Luscinia rubecula*; *ornatissimus*, p. 144, on *Agelaius phœnicurus* (dry skin); *angusticeps*, p. 154, on *Hemipodius pugnax* (dry skin); *punctatus* (*punctulatus*, p. 301), p. 156, on *Charadrius morinellus*; *tristis*, p. 168 (nom. bis lect; vide p. 143), on *Scolopax gallinago*; *intermedia*, p. 169 (*mystax*, p. 301), on *Ortygometra porzana*; *lugens*, p. 170, on *Porphyrion poliocephalus* (or *P. smaragdinus* ?); *birostris*, p. 174, on *Sterna fuliginosa* ?; *felix*, p. 175, on *Larus heermanni*; *æthereus*, p. 301, on *Simorynchus microcerus* (dry skin).

Goniocotes obscurus, p. 188, on *Phaps chalcoptera*; *albidus*, p. 189, on *Phasianus nychthemerus*.

Goniodes truncatus, p. 194, on *Perdix rubra*; *cervinicornis*, p. 199, on *Phasianus colchicus*.

Lipurus assessor, p. 207, on *Sarcorhamphus gryphus*; *frater*, p. 210, on *Neophron percnopterus*; *secretarius*, p. 213, on *Gypogeranus serpentarius*; *antennatus*, l. c., on *Baza lophotes*; *orthopleurus* (Nitzsch), p. 217, on *Argus giganteus*; *obscurus*, p. 220, on *Perdix rufa*; *achraceus* (Nitzsch), p. 221, on *Tetrao urogallus*; *quadrinus* (Nitzsch), p. 222, on *Craz*

carunculata; *angustissimus* (Nitzsch) on *Hemipodius pugnax* (dry skin); *fissomaculatus*, p. 225, on *Mycteria crumenifera*; *modestus*, p. 233, on *Lestris pomarina*; *nigrolimbatus*, l. c., on *Porcellaria* (sp. ?); *clypeatus*, p. 236, on *Pachyptila cerulescens*; *crenatus*, p. 237, on *Tachypetes leucocephalus*; *frater*||, p. 242 [vide p. 210], on *Anas glacialis*; *gracilis*, l. c., on *A. spectabilis*; *falcicornis*, p. 244, on *Centropus menebecki*.

Liotheidæ.

Læmbothrium pallidum (Nitzsch), p. 250, on *Neophron percnopterus*; *nigrolimbatus*, p. 252, on *Circus cinerascens* and *æruinosus*; *lichtensteini*, p. 253, pl. xviii. fig. 8, on an ostrich; *gracile*, p. 254, on *Psophia crepitans*; *nocturnum*, p. 302, on *Strix alco*.

Physostomum pratextum (Nitzsch), p. 257, on *Campylops mexicanus*.

Trinotum stramineum, p. 302, on *Hirundo americana*.

Colpocephalum megalops, p. 261, on *Sarcorhamphus papa*; *caudatum*, l. c., on *Vultur indicus*; *cucullare*, p. 264, on *Gypogeranus serpentarius*; *deperdatum*, p. 265, pl. xiii. fig. 9, on *Corvus cornix*; *albonigrum*, p. 266, on *Cassicus cristatus*; *subrotundum* on *Musophaga violacea* (dry skin); *albidum*, p. 268, on *Phaps chalcoptera*; *obscurum*, p. 273, on *Ardea egretta*; *leptopygus* (Nitzsch), l. c., on *Ibis sacra* (dry skin); *fusco-nigrum*, p. 274, on *Ibis alba*; *trilobatum*, p. 275, on *Tringa minuta*; *affine* (Nitzsch), p. 276, on *Totanus maculatus*; *flavipes*, l. c., on *Vanellus varius*; *brachycephalum*, p. 278, on *Lestris pomarina*.

Menopon gryphus, p. 279, on *Sarcorhamphus gryphus*; *albidum*, p. 280, on *Neophron percnopterus*; *longipes*, l. c., on *Strix bubo*; *annulatum*, p. 285, on *Passer domesticus*; *thoracicum*, p. 287, on *Turdus viscivorus*; *rusticum*, p. 288, on *Hirundo rustica*; *truncatum*, l. c., on *Muscicapa petangua*; *camelinum* (Nitzsch), l. c. pl. xv. fig. 3, on *Lanius excubitor*; *furcipatum* (Nitzsch), p. 289, pl. xv. figs. 7 & 8, on *Buceros rhinoceros* (dry skin); *platygaster*, p. 290, on *Scythrops novæ-hollandiæ*; *numidæ*, p. 292, on *Numida meleagris*; *spinulosum*, p. 293, on *Polyplectron tibetanum*; *brachygaster*, l. c., on *Crypturus tao*; *ambiguum* (Nitzsch), p. 295, on *Numenius phæopus*; *cursorius*, p. 296, on *Cursorius isabellinus*.

Oncophorus, g. n., Rudow, Z. ges. Naturw. (2) xxxv. [1870], p. 299. *Philopteridæ*; type, *Trabeculus schillingi*, Rud. (= *Docophorus*, Nitz.; Giebel, l. c. p. 121).

Ancistronea, g. n., Westwood, Thes. ent. oxon. p. 197. *Liotheidæ*; underside of the head with a large bipartite horny process. *A. procellariæ*, sp. n., *id. ibid.* pl. xxxvii. fig. 4, parasitic on *Procellaria capensis*.

TERMITIDÆ.

Fritz Müller's observations are condensed in Am. Nat. viii. p. 554 (cf. Zool. Rec. x. p. 433).

Calotermes. A species bred at Kew from the wood of *Trachylobium hornmannianum* from Zanzibar; McLachlan, P. E. Soc. 1874, p. xiii.

PERLIDÆ.

GERSTÄCKER, Z. wiss. Zool. xxiv. pp. 204-252, supplements his pre-

vious publication on the presence of external tracheal organs in this family (cf. Zool. Rec. x. p. 435), by a recapitulation of what has been published on the subject. He concludes that in those species which, in the larval state, possess prosternal gills, these latter are present also in the perfect insects, and in the same number, form and position. His observations especially concern a species of *Nemoura*, which he considers to be *N. lateralis*, Pict. In this, he proves the existence of three oval gills on each side of the prosternum in the perfect insect, homologues of those that exist in the insect in its sub-aquatic condition. These gills are each traversed by a main branch of the internal trachea, with subsidiary ramifications. The paper concludes with a detailed account of the external anatomy of the species, more especially with regard to the formation of the genital parts in both sexes, and is illustrated by a plate (xxiii.) with beautifully executed figures illustrating all the principal points touched upon in the paper.

EPHEMERIDÆ.

JOLY, ÉMILE. Note sur les caractères d'une larve d'insectes Orthoptères de la famille des Ephémérines. Rev. Soc. sav. (2) iii. [The Recorder has seen only a separate copy, pp. 1-8.]

Treats on a larval form found at Toulouse, the chief peculiarity of which is that the respiratory organs are protected by two trapezoidal lamellæ of singular structure. He refers it doubtfully to *Canis*.

ODONATA.

HAGEN, H. A. The Odonate Fauna of Georgia, from original drawings now in the possession of Dr. J. Leconte, and in the British Museum. P. Bost. Soc. xvi. pp. 349-365.

A list of species (chiefly *Odonata*) collected at Grimsby, Ontario, is given by PETTIT in Canad. Ent. vi. p. 45.

SPAGNOLINI (Bull. Ent. Ital. vi. pp. 31-37) gives a list of 25 spp. from Modena and (pp. 38-42) of 16 spp. from Leghorn.

DE SELYS-LONGCHAMPS publishes a list of 20 spp. observed by him at Maeseyck in Belgium, in CR. Ent. Belg. xvii. pp. cv. & cvi.

Corduliina.

SELYS-LONGCHAMPS, E. DE. Additions au Synopsis des Cordulines, Bruxelles: 1874, pp. 1-24. Also in Bull. Ac. Belg. (2) xxxvii., but only the separate form has been seen by the Recorder.

The number of known species is elevated to 91, and descriptions are given of previously unknown sexes. *Macromia whitei*, Selys, = *cingulata*, Ramb., and the locality for *cingulata* is Bengal, not North America, p. 14. The following new species are described:—

Epithea nasalis, p. 10, North America.

Gomphomacromia volxemi, ibid., Brazil.

Macromia magnifica (McLachlan), p. 11, California, *westwoodi*, p. 16, Penang, *moorei*, p. 17, Himalaya.

Synthemis regina, p. 20, Queensland, *virgula*, p. 22, Melbourne.

Æschnina.

Anax ephippigera. Ghiliani, Bull. Ent. Ital. vi. pp. 227-228, gives notes on 'invasions' by this species in Italy.

Æschna furcillata, Say, re-described by Hagen, P. Bost. Soc. xvi. p. 352.

Æschna abboti, p. 350, Georgia, *antelope*, p. 354, Baltimore, spp. nn., Hagen, l. c.

Ocalopterygina.

Calopteryx virgo. A singular aberration of this species, from a French example in McLachlan's collection, figured by Westwood, Thes. ent. oxon., pl. xxxv. fig. 15.

ORTHOPTERA.

BY

ROBERT McLACHLAN, F.L.S.

THE GENERAL SUBJECT.

BRUNNER VON WATTENWYL, C. Ueber Systematik der *Orthoptera* und die Recensio Orthopterorum von C. Stål. Verh. z.-b. Wien, xxiv. pp. 225-230.

A somewhat severe critique of the work in question. Explanatory woodcuts are given.

——. Ueber die äusseren Gehörorgane der *Orthoptera*. Tom. cit. pp. 285-288.

These organs are noticed as '*Tympanum apertum*,' '*Tympanum fornicatum*,' and '*Tympanum clausum*'; and detailed descriptions (with explanatory woodcuts) are given, illustrating the structure in the three stridulating families, *Acrydiidæ*, *Locustidæ*, and *Gryllidæ*.

GRABER, V. Bemerkungen über die "Gehör- und Stimmorgane" der Heuschrecken und Cikaden. SB. Ak. Wien, lxvi. [1872] pt. i. pp. 205-213.

The author firstly combats Landois' theory that the tympanum of the *Cicadæ* is the envelope of the so-called ear in the *Gryllidæ* and *Acrydiidæ*. Secondly, he enters at length into the method in which *Stethophyma grossum* and *Edipoda tuberculata* produce their noise, with explanatory woodcuts. In the former the tibia is rubbed against the inner margin of the clytra; in the latter both sexes stridulate, and the sound is produced by the friction of the thick marginal nervures of

the hind-wings against the underside of the elytra. Generally he agrees with Von Siebold's previously published observations on the subject.

SAUSSURE, H. DE. Fedtschenko's Turkestan [*antea*, p. 250] (*Orthoptera*). 4to, pp. 52, pl. i. (pl. ii. to be published hereafter).

Includes 6 spp. of *Forficulina*, 7 of *Blattina*, 13 of *Mantodea*, 1 of *Phasmodea*, 20 of *Gryllodea*, and 27 of *Locustidæ* (the figures relating to the latter are to be on pl. ii).

— Mission Scientifique au Mexique, et dans l'Amérique Centrale ; ouvrage publié par ordre du Ministre de l'instruction publique. Recherches Zoologiques. 6^{me} partie. Études sur les Orthoptères, 3^{me} livraison, 1874, pp. 293-516, pls. 7 & 8 (*cf.* Zool. Rec. ix. p. 395).

The part now under consideration is almost entirely occupied by the *Gryllidæ*.

SCUDDER, S. H. List of the *Orthoptera* of New Hampshire, with notes on their Geographical Distribution and Stridulation. Final Report upon the Geology of New Hampshire, i. pp. 362-380.

Enumerates 46 known species, with copious notes on habits, &c. The stridulation of several species is ingeniously set to musical notation. On the accompanying Plate A, the following are figured:—*Gryllotalpa borealis*, Burm., fig. 7, *Pezotettix glacialis*, Scudd., figs. 5 & 10, and *Dia-pheromera femorata*, Scudd., fig. 3.

SIEBKE, H. Catalogus Orthopterorum Norvegiæ. Forms a portion of part i. of the 'Enumeratio Insectorum Norvegicorum' by this author, pp. 53-60.

Enumerates 35 known spp. as occurring in Norway (Zetterstedt's disputed vars. or species of *Tettix* are given specific rank).

STÅL, C. Recensio Orthopterorum. Revue critique des Orthoptères décrits par Linné, De Geer, et Thunberg. Pt. ii. Stockholm : 1874, 8vo, pp. 1-121.

A continuation of this work, noticed in Zool. Rec. x. p. 439. The present part treats wholly upon *Locustidæ* [*infra*, p. 465].

SWINTON, A. H. Notes on certain fossil *Orthoptera* claiming affinity with the genus *Gryllacris*. Geol. Mag. (2) i. pp. 337-341, pl. xiv.

A comparison of the sound-producing organs in fossil, with those of recent species, the author insisting that these organs in the species inhabiting the cryptogamic forests of the coal-measure period, were constructed in the same manner as in those that now exist. On the plate a (restored) figure of *Gryllacris ungeri*, Heer, is given, together with enlarged outlines of the neuration of recent species and of *G. brongniarti*, Audouin.

GHILIANI (Bull. Ent. Ital. vi. pp. 96-98) notices certain species taken by him at and near Sangano in Piedmont, with notes on variation.

Notes on the carnivorous propensities of certain species of *Locustidæ* and *Acrydiidæ* by GIRARD & PEYERIMHOFF are published in Bull. Soc.

Ent. Fr. (5) iv. pp. ix., clxxv. & clxxvi. The last named author has some curious notes on the manner in which common species of *Acrydium* attacked his shirt, saturated with perspiration, when lying out to dry on the ground.

FORFICULIDÆ.

Forficula fedtschenkoi, Saussure, Fedtschenko's Turkestan, p. 6, pl. i. fig. 2, Sarafschan and Ferghana; *F. petropolis* [!], J. G. Wood, "Insects Abroad," p. 279, fig., S. America: spp. nn.

Forficesila longissima, "new species," J. G. Wood, l. c. pp. 279 & 280 (fig.), "Chorिताles."

BLATTIDÆ.

Blattina bretonensis and *heeri*, two new fossil Cockroaches from the carboniferous of Cape Breton, are described (from single upper wing, of which figures are given) by S. H. Scudder, Canad. Nat. (n. s.) vii. pp. 271 & 272.

Aphlebia tartara, sp. n., Saussure, Fedtschenko's Turkestan, p. 7, pl. i. fig. 4, Sarafschan and Ferghana.

Loboptera tartara, sp. n., id. l. c. p. 8, pl. i. fig. 5, Sarafschan.

Periplaneta tartara, sp. n., id. l. c. p. 9, Khokand.

Ellipsidion gracile, sp. n., Butler, Cist. Ent. pt. x. p. 294, Rockhampton.

MANTIDÆ.

SAUSSURE, in Fedtschenko's Turkestan, figures the following known species:—

Ameles alata, Sauss., pl. i. figs. 6 & 7.

Oxythespis turcomaniæ, Sauss., pl. i. fig. 8.

PHASMIDÆ.

WESTWOOD, Thes. ent. oxon., figures and describes the following species:—

Heteropteryx dilatata, Parkinson (= *hopei*, Westw.), p. 172, pl. xxxii. fig. 1; *H. castelnaudi*, p. 174, fig. 3, Tringany.

Extatosoma bufonium, p. 174, pl. xxxii. fig. 2, Australia.

Ceroys laciniatus, l. c. fig. 4, Nicaragua.

GRYLLIDÆ.

SAUSSURE, Mission Scientifique au Mexique, pp. 296-332, enters into a detailed account of the structure of the group, its manners, classification, &c., &c.; not only with regard to species occurring in Central and South America, but generally, with enlarged views respecting the sound-producing organs, rendered more valuable from the beautifully executed explanatory plate. He divides the family into *Gryllotalpiens*, *Trigoni-*

diens, *Grylliens*, *Myrmécophiliens*, and *Æcanthiens*, and to a great extent confessedly ignores the British Museum Catalogue by Walker, as being useless unless reference be made to the types.

Gryllotalpiens.

Scapteriscus didactylus, Latr., pl. viii. fig. 20, elytron.

Gryllotalpa hexadactyla, Perty, pl. viii. fig. 22, elytron.

Gryllotalpa maculata, p. 343, pl. viii. figs. 23 & 23a, Surinam, *major*, l. c. Illinois, *intermedia*, p. 345, Mexico and Central America, *clarazianu*, p. 346, pl. viii. fig. 21, elytron, Argentine Republic, spp. nn.

Tridactylus fissipes, p. 352, pl. viii. figs. 25 & 25a, Louisiana, *denticulatus*, p. 353, pl. viii. figs. 26 & 26a, Para, spp. nn.

Rhipipteryx trilobata, p. 357, Guiana, *circumcincta*, p. 358, South America, *cyanipennis*, l. c. Surinam and Venezuela, spp. nn.

Trigonidiens.

Homæoxipha, g. n., p. 363. Tibiæ perforated through and through. Wings sometimes long. Allied to *Trigonidium*. (No type given, and not an American form.)

Anaxipha, g. n., p. 370. Allied to *Cyrtoxipha*, but the tibiæ pierced on one side only or not at all. Wings usually short. Type, *Anaxipha pulicaria*, Burm., pl. vii. fig. 1.

Phylloscyrtus ceruleus, p. 366, pl. vii. figs. 3 & 3a, Mexico, *brunnerianus*, p. 368, pl. vii. fig. 4, Mexico, spp. nn.

Cyrtoxipha gundlachi, p. 373, pl. vii. fig. 2, Cuba and Southern United States, *azteca*, p. 375, Mexico, *tolteca*, p. 376, Mexico, *angusticollis*, p. 377, pl. vii. fig. 2, Mexico, *peruviana*, p. 378, Peru, spp. nn.

Grylliens.

Gryllus assimilis, F., pl. viii. figs. 27-29, *mexicanus*, Sauss., pl. viii. figs. 30 & 30a, and *muticus*, De Geer, pl. vii. fig. 9, are figured.

Gryllodes, g. n., p. 409. An offshoot of *Gryllus*, distinguished by the elytra of the ♀ being occupied by strong longitudinal nervures; those of the ♂ with only two oblique sinuated veins; the mediastine vein simple in the ♀, sometimes one-branched in the ♂. Formed for *Gryllus muticus*, De Geer, *G. pusillus*, Burm., pl. vii. fig. 6, and *Gryllodes clarazianus*, p. 412, pl. viii. fig. 31, Argentine Republic, *caraiheus*, p. 413, Brazil, *antillarum*, p. 414, pl. vii. figs. 10 & 13, Cuba, *abortivus*, p. 415, pl. vii. fig. 11, Mexico, *micromegas*, p. 418, Mexico, *brevipennis*, l. c. Peru, *parvipennis*, p. 419, Brazil, *poeyi*, p. 420, pl. vii. fig. 8, Cuba, *patagonus*, p. 421, pl. vii. fig. 12, Patagonia, spp. nn.

Nemobius longipennis, p. 383, Argentine Republic, *cubensis*, p. 384, pl. vii. fig. 5, Cuba, Mexico, and Brazil, *paraná*, p. 386, Argentine Republic, *dissimilis*, p. 387, Brazil, *araucanus*, p. 388, Chili, *nemoralis*, p. 390, Argentine Republic, Brazil, Peru, spp. nn.

Gryllus argentinus, p. 399, Argentine Republic, Brazil, Chili, Patagonia, &c., *scudderianus*, p. 402, North America, *capitatus*, p. 405, Peru and Chili, *bicolor*, l. c., Guiana, *peruviensis*, p. 406, Peru, *forticeps*, p. 407, Brazil, *laplate*, p. 408, Argentine Republic, spp. nn.

Myrmécophilens.

Cycloptilum americanum, sp. n., p. 426, pl. viii. figs. 41 & 42, Cuba.

Ecanthiens.

Divided into two legions, *Ecanthites* and *Enéoptérites*. *Paræcanthus mexicanus*, Sauss., pl. viii. figs. 33-36, and *Apithis quadrata*, Scudd., pl. vii. figs. 16 & 17, are figured. *Gryllus (Eneoptera) lividus*, De Haan, nec Burm., is re-named *Metrypa haani*, p. 515.

The following new genera and species are described in the *Ecanthites* :—

Diplacusta, p. 432. Approaches *Prosthacusta* in the form of the head, but differs by the front somewhat more prolonged between the antennæ, by the anterior tibiæ being provided with a complete double drum, by the neuration of the lateral area of the elytra, &c. Includes *Lerneca varipes*, Walker, and *D. fuscipennis*, p. 433, Brazil, and *inalata*, p. 435, Surinam.

Prosthacusta, p. 436. Differs from *Gryllormorpha* by its more compressed body, the ♂ provided with elytra, and with a more or less developed drum, &c. Type, *P. mexicana*, p. 437, pl. vii. fig. 18, Mexico.

Dyscophus, p. 438. Differs from the preceding in the front being deflexed, elytra of ♂ rudimentary; anterior tibiæ pierced, but their drum often obsolete, &c. Type, *P. saltator*, p. 438, Brazil and Peru.

Heterogryllus, p. 439. Distinguished especially by the form of its frontal snout, and the disposition of the ocelli, the anterior one being placed at the extremity of the snout. Type, *H. ocellaris*, p. 440, Brazil.

Amphiacusta, p. 444. Resembling *Phalangopsis*, but always distinguished by the posterior ocelli being as large as the anterior, by the less narrow frontal snout, by the anterior tibiæ being pierced through and through, &c. Includes *Phalangopsis annulipes*, Serv. (pl. viii. fig. 40), and *azteca*, Sauss. (pl. viii. figs. 39 & 39a), and *A. grandis*, p. 447, Cuba and Guadeloupe, and *phalangium*, p. 450, Central America.

Cophus, p. 454. Differs from *Phalangopsis* by a less elongate and smaller head, by the tibiæ which are canaliculate beneath, as well as the first joint of the posterior tarsi, which bears also two rows of spinules. Type, *Cophus thoracicus*, p. 455, Cuba.

Paragryllus rez, p. 442, Brazil.

Phalangopsis gaudichaudi, p. 453, Brazil.

Ecanthus argentinus, p. 460, La Plata, *californicus*, p. 462, California.

The following new genera and species are described in the *Enéoptérites* :—

Ectrotrypa, p. 466. Elytra of ♂ with a drum, which is complete, and with well developed oblique veins; head elongate, the snout divided in front, pronotum much elongated, not angulated in front. Type, *E. olmeca*, p. 467, Mexico.

Diatrypa, p. 476. Differs from *Orocharis* by the form of the oviscape and by the elytral drum of the ♂, which offers plain and oblique veins; from *Paræcanthus* by the strongly developed drum of the anterior tibiæ, the ♀ by the form of the oviscape, the ♂ by the oblique veins of the elytral drum, &c. For *D. tolteca*, p. 478, pl. vii. fig. 19, Mexico, *tuberculata*, p. 479, Buenos Ayres, *ornata*, p. 480, Surinam?

Anaudus, p. 507. Approaches *Podoscirtus*, but the anterior tibiae pierced only on one side as in *Eneoptera*, from which it differs by the globular form of the head, by the large approximate ocelli, &c. Type, *A. thoracicus*, p. 507, Bahia.

Aphonus, p. 509. Distinguished from *Euscirtus*, *Podoscirtus*, and *Anaudus* by the single drum of the anterior tibiae, which is placed on their internal surface. Includes *Platydictylus diversus*, Walk., *Eneoptera livida*, Burm., and *A. mutus*, p. 510, Guiana, *peruvianus*, p. 511, Peru, *jelskii*, l. c., Peru and Brazil.

Paracanthus fallax, p. 470, pl. vii. fig. 15, Cuba, *aztecus*, p. 471, Mexico, *niger*, p. 474, Guatemala, *guatemalæ*, p. 475, Guatemala.

Eneoptera heydeni, p. 485, Brazil.

Apithis azteca, p. 490, Mexico, *annulicornis*, p. 491, Surinam.

Orocharis helvola, p. 495, Guiana, *antillarum*, p. 496, Guadeloupe, *rodriguezi*, p. 497, Central America, (?) *conspersa*, p. 499, Brazil.

Euscirtus mexicanus, p. 501, pl. vii. fig. 14, Mexico.

Podoscirtus couloni, p. 504, Cuba, *viduus*, p. 505, Brazil.

Xya variegata, Kittary, is re-named *Tridactylus tartarus*, p. 26, pl. i. fig. 10, and *Gryllus pipiens*, Dufour, pl. i. fig. 11, *desertus*, Pallas, pl. i. fig. 12, *cerisii*, Serv., pl. i. fig. 13, are figured either wholly or in detail, by Saussure, Fedtschenko's Turkestan.

Gryllotalpa unispina, sp. n., *id. l. c.* p. 24, pl. i. fig. 9, Samarcand and Taschkent.

Gryllus tartarus, sp. n., *id. l. c.* p. 34, pl. i. fig. 14, Sarafschan.

Nemobius tartarus, sp. n., *id. l. c.* p. 36, pl. i. fig. 15, Samarcand and Caucasus.

LOCUSTIDÆ.

HERMAN, OTTO. Die Decticien der Brunner von Wattenwyl'schen Sammlung. i. Genera. Verh. z.-b. Wien, xxiv. pp. 191-210, pls. iii.-vi.

A revision of the sub-family *Decticidæ* in Brunner von Wattenwyl's collection, so far as regards the genera, with especial regard to the writings of American entomologists. The author recognizes the following genera or sub-genera:—*Gampsocleis* and *Rhacocleis*, Fieb., *Thyreonotus*, Serv., *Pterolepis*, Fisch., *Drymadusa*, Stein, *Decticus*, Serv., *Platycleis*, Fieb., *Psorodonotus*, Brun., *Anabrus*, Hald., and *Thamnotrizon*, Fisch., and the following new genera:—

Metaballus, p. 197. Pronotum compressed, without process; elytra half developed, excised on the inner margin in ♂ & ♀; tympanum of the left elytron trapezoidal in the ♂; cerci with acuminate apex in the ♂; supra-anal lamina produced into two blunt points; ovipositor long, sword-shaped. Type, *M. sagæformis* [*sagif*], sp. n., p. 202, pl. iii. figs. 14-19, Adelaide.

Rhachidorus, l. c. Pronotum compressed, with a lanceolate process; elytra developed in ♂ & ♀; tympanum of left elytra trapezoidal in the ♂; cerci short, without lateral tooth; ovipositor straight, scarcely curved downward. Type, *R. marginatus*, sp. n., p. 203, pl. iii. figs. 20-24, North Australia.

Arytropteris, p. 198. Vertex narrowed, with shallow channel. Pronotum with excessively prolonged process, the latter, from the base of the impressed marking, longer, or as long as, the anterior portion together with the head. Elytra hood-shaped, retracted under the process. Cerci with small lateral tooth at the tip. Ovipositor acute, at the end slightly curved outward. Types, *A. angulosa* (Brun.), sp. n., p. 198, pl. iv. figs. 31-36, Zulu and Port Natal, and *A. steindachneri*, sp. n., l. c. pl. vi. figs. 98-102, California.

Paradrymadusa (sub-g. n.) p. 199. Allied to *Drymadusa*. Elytra squamiform, free in the ♂, abbreviated in the ♀. Pronotum only slightly compressed, the process short, rounded. Tympanum of the ♂ trapezoidal. Cerci curved one on the other, with a lateral tooth near the apex. Sub-genital lamina with two short points. Ovipositor conspicuously curved downward. Type, *P. sordida*, sp. n., p. 206, pl. v. figs. 49-53, Caucasus.

Steiroxys [Stir.], p. 200. Allied to *Decticus* and *Platycleis*. Elytra abbreviated in the ♀. Pronotum slightly compressed, the process slightly produced, anteriorly sub-parallel. Cerci short, with blunt flattened point and lateral tooth. Ovipositor sabre-shaped, curved upward, finely serrate. Type, *Thamnotrizon trilineatus*, Thomas, pl. v. figs. 64-69.

The following are also figured, and briefly described, as types of existing genera:—

Gampsocleis abbreviata (Brun.), sp. n., p. 201, pl. iii. figs. 1-7, Dalmatia.

Rhacocleis buchicht, p. 201, pl. iii. figs. 20-24, Dalmatia.

Thyreonotus corsicus, Serv. p. 203, pl. iv. figs. 25-33.

Pterolepis brunneri, Krauss, p. 205, pl. iv. figs. 47-42.

Drymadusa spectabilis, Stein, p. 206, pl. iv. figs. 43-48.

Decticus albifrons, F., l. c. pl. v. figs. 54-58.

Platycleis intermedia, Serv., p. 207, pl. v. figs. 59-63.

Psorodonotus fieberi, Friv., p. 208, pl. vi. figs. 70-75.

Anabrus simplex, Hald., p. 209, pl. vi. figs. 76-86.

Thamnotrizon chabrieri, Chp., *apterus*, F., and *striolatus*, Fieb., pl. vi. figs. 87-96.

STÅL, in part ii. of his 'Recensio Orthopterorum,' enters at length into the arrangement and value of this group as defined by Burmeister, and considers it to be one of the best marked. He enlarges upon the difficulties presented by the absence of notes on special structural characters in the works of previous authors, and in some genera (e. g., *Xiphidium*) renounces as impossible any endeavours to disentangle the species from the materials before him. The family is divided into five sub-families—*Phyllophoridae*, *Pseudophyllidae*, *Conocephalidae*, *Gryllacridae*, and *Stenopelmatidae*, the characters of which are detailed in a dichotomous form. The genera under each sub-family are worked out in the same dichotomous manner. For the proper definition of the new genera in a condensed form it would be necessary that a Recorder should have paid special attention to the group, and it is therefore proposed to

simply enumerate them (with the new species) in the order given in the work. An analysis of the bibliography and synonymy could not be made here, and is scarcely necessary, because every student of the group must have the work before him.

Phyllophoridae.

- Dinarchus*, p. 7. Type, *Locusta armadillo*, Thbg. (= *dasypus*, Illig.).
Ductia, p. 11. Type, *Locusta japonica*, Thbg.
Elimæa, ibid. Type, *Phanoptera subcarinata*, Stål.
Cædicia, p. 12. Type, *C. pictipes*, sp. n., p. 27, Cape York.
Polichne, p. 13. Type, *Phanoptera parvicauda*, Stål.
Turpilia, p. 16. Type, *T. punctata*, sp. n., p. 31, St. Bartholomew.
Plagioptera nitidipennis, sp. n., p. 34, Columbia.
Phrica, p. 16. Type, *P. nasuta*, sp. n., p. 36, Mexico.
Holochlora biloba, sp. n., p. 39, Madagascar.
Eurycorypha prasinata, sp. n., p. 40, Madagascar.
Peucestes, p. 20. Includes *Phanoptera citrifolia*, Blanch., and *Peucestes coronatus*, sp. n., p. 45, Mexico.
Posidippus, ibid. Type, *Gryllus citrifolius*, L.
Frontinus, ibid. Type, *Locusta citrifolia*, De Geer, ♀.
Ægimia, p. 21. Type, *Æ. cultrifera*, sp. n. p. 46, Mexico.

Pseudophyllidæ.

- Mustius*, p. 50. Type, *Pseudophyllus afzeli*, Stål.
Cleandrus, ibid. Type, *P. graniger*, Serv.
Cratylus, p. 51. Includes *Conocephalus inflatus*, Thbg., and *P. lineolatus*, Stål.
Onomarchus, ibid. Type, *P. leuconotus*, Serv.
Sathrophyllia, p. 54. Includes *Gryllus rugosus*, L., and *S. fuliginosa*, p. 70, India, *marmorata* and *torrida*, p. 71, spp. nn., localities unknown, and *Locusta femorata*, De Haan.
Tarphe, ibid. Includes *Locusta novæ-hollandiæ*, De Haan, and *T. viridinotata*, sp. n., p. 72, Assam.
Termera, ibid. Type, *Acanthodis imperialis*, Westw.
Tanusia, p. 57. Type, *Pterochroza sinuosa*, Stål.
Parysatis, ibid. Type, *P. crassicornis*, sp. n., p. 74, N. Brazil.
Tetragonomera, p. 60. Type, *Acanthodis marmorata*, Burm.
Pleminia, p. 61. Includes *Acanthodis brachyptera*, Burm., and *P. repanda*, sp. n., p. 78, Mexico.
Brisilis longicauda, sp. n., p. 79, locality unknown.
Acanthodis cuspidata, sp. n., p. 83, Columbia.
Meronicidius alutaceus, Brazil, and *M. atrispinus*, Costa Rica, p. 84, spp. nn.
Teleutias, p. 65. Type, *T. aduncus*, sp. n., p. 88, locality unknown.
Cocconotus retiarius, sp. n., p. 90, Columbia.
Moristus nubilus, sp. n., p. 96, locality unknown.

Conocephalidæ.

- Copiophora conspersa*, p. 104, Surinam, and *capito*, p. 105, South America, spp. nn.
Vestria, p. 97. Type, *V. nigricauda*, sp. n., p. 105, locality unknown.
 1874. [VOL. XI.]

- Subria*, p. 101. Type, *S. nitida*, sp. n., p. 114, Columbia.
Teuthras, p. 102. Type, *Listroscelis pectinata*, Serv.
Thysdrus, ibid. Includes *Locusta teres*, De Geer, *Conocephalus virens*, Thbg., and *T. tener*, sp. n., p. 117, South Brazil.
Terpandrus, p. 103. Type, *Hexacentrus horridus*, Burm.

Thamnotrizon tartarus, sp. n., Saussure, Fedschenko's Turkestan, p. 42, Turkestan.

Decticus (Platycleis) fedtschenkoi, l. c. p. 45, Samarcand and Bairakum, tamerlanus, p. 46, Samarcand, spp. nn.

Hemidina producta, Walk., = *thoracica*, White; A. G. Butler, Zoology of the Voyage of Erebus and Terror, ii. Insects, p. 25.

Physophorina, g. n., Westwood, Thesaurus entomologicus oxoniensis, p. 175. Type, *P. livingstonii*, sp. n., id. ibid., pl. xxii. fig. 5, Zambesi.

Tetricordina, g. n., id. l. c. p. 175. Type, *T. luteo-marginata*, sp. n., id. l. c. p. 176, fig. 6, Menado, Dorey, and New Guinea.

C. V. Riley, in Rep. Ins. Mo. vi. pp. 150-169, gives a good general account of the American stridulating species known as 'Katyids,' describing and figuring *Microcentrus retinervis*, Burm., *Phaneroptera curvicauda*, De Geer, *Platyphyllum concavum*, Harris, and *Phylloptera oblongifolia*, De Geer, with notes on transformations and parasites.

ACRYDIDÆ.

Caloptenus spretus. Notes on the occurrence of the 'Hateful Grass-hopper' in New England. Am. Nat. viii. p. 502.

A review and analysis of Cyrus Thomas' 'Acrididæ of North America' (cf. Zool. Rec. x. p. 442) is given in Ann. N. H. (4) xiii. pp. 322-324.

Edipoda germanica. Notes on the varieties of this species as observed in S. Europe are given by F. A. Walker, in Ent. vii. pp. 79 & 80.

RHYNCHOTA.

BY

E. C. RYE, F.Z.S.

LETHIERRY, L. Catalogue des Hémiptères du Département du Nord. Lille: 1869 [omitted from Zool. Rec. vi.], 8vo, pp. 1-70.

373 species (3 new) are briefly noticed. The district is reported as not being rich; *Pyrrhocoris apterus*, *Lygæus equestris*, and *L. familiaris*, very common in all the environs of Paris, are not found in it (the first 2 are recorded in the 2nd edition).

LETHIERY, L. 2^e Édition. Lille : 1874, 8vo, pp. 1–108, pls. i. & ii.

Some new species are described. This work is much more than a mere catalogue, giving copious and precise notes of localities, habits, food-plants, tables of characters, &c. It contains 670 species. Reviewed by Lichtenstein, Bull. Soc. Ent. Fr. (5) iv. p. ccli.

HEMIPTERA—HETEROPTERA.

FERRARI, P. M. Hemiptera Agri Ligustici hucusque lecta—enumerat. Genova : 1874, 8vo, pp. 1–103.

361 species (some new), contained in 205 genera, are enumerated, with synonymy, descriptions of varieties, &c., from the Riviere di Genova. Some other species are mentioned and described, chiefly from Persia. This work, which has a separate title and index, is stated to be an extract from Ann. Mus. Genov. "vi. 1874," and also bears the pagination 116–208, referring to that work, of which vol. v. only was issued in 1874. It is therefore doubtful whether it can be considered as published.

HORVÁTH, GEYZA VON. Hemiptera Scutata Faunæ Hungaricæ (A Magyar Fauna Pajzos Félropüi). Budapest : 1873 [extracted from the "Mémoires de l'Association des Médecins et des Naturalistes Hongrois," 1872].

A systematic catalogue of 16 *Scutellerides* and 72 *Pentatomides* known from Hungary. Kraatz, B. E. Z. xviii. p. 231, compares these with the number of species known from other countries, viz. :—11 & 50 from Bavaria, 13 & 50 from Tyrol, 27 & 90 from Italy, 23 & 89 from France, 7 & 33 from Livland, 7 & 30 from Denmark, 5 & 28 from England. Cf. also Pet. Nouv. vi. p. 386 [and Zool. Rec. ix. p. 400, for another work by this author, also not seen by the Recorder].

JACOVLEV [or JAKOWLEFF], B. E. Hemiptera Heteroptera Astrachanskago Chraia. Bull. Mosc. xviii. pt. i. pp. 218–277, pl. x.

Observations (in Russian) on the species known from Astracan. New genera and species are characterized.

In this paper, the author refers to the following species as described by himself in the "Troudy" (= Les Annales Russes) of the Russian Entomological Society [see Zool. Rec. ix. p. 230] :—*Tarisa pallescens*, vi. p. 33, *Leprosoma solskii*, vii. pp. 20 & 42, pl. i. fig. 7, *Leptocera viridis*, vii. p. 39, pl. i. fig. 5, *Rhopalus unicolor*, vii. p. 40, pl. i. fig. 6, *Ischnodemus caspius*, vi. p. 26, pl. i. fig. 5, *Nygias punctipes*, vi. p. 8, *Ophthalmicus arenarius*, Jak., var. n. *albidus*, vi. p. 31, pl. i. fig. 9, *O. oschanini*, vi. p. 27, pl. i. fig. 6, *O. desertorum*, vi. p. 30, pl. i. fig. 8, *O. lapponicus*, Zett., var. n. *pubescens*, vi. p. 29, pl. i. fig. 7, *Megalonotus marginatus*, vii. p. 36, pl. i. fig. 3, *Holocranum megacephalum*, vii. p. 37, pl. i. fig. 4, *Zosmenus viridulus*, vi. p. 5 (= *atriplicis*, Frey), *Z. minutus*, vi. p. 6, *viridis*, vi. p. 7, *feberi*, vii. p. 27, pl. i. fig. 8, *chenopodii*, vii. p. 27, pl. i. fig. 9, *dilatatus*, vii. p. 28, pl. i. fig. 10, *convexicollis*, vii. p. 29, pl. i. fig. 4, *Monanthia pusilla*, vii. p. 33, *Dictyonota beckeri*, vi. p. 25, *Mantisoma* [apparently g. n.] *aptera*, vii. pp. 11 & 35, pl. i. fig. 2, *Fieberia* [apparently g. n.] *lacustris*, vii. pp. 9 & 33, pl. i. fig. 1; also *Strachia maracandica*,

Oshanine, Nachr. Ges. Mosc. viii. p. 202: all from Astracan. These species are noted here, as they have hitherto escaped record on account of their medium of publication.

POPULUS, —. Catalogue des Hémiptères du département de l'Yonne (Extr. from Bull. Soc. Yonne, xxviii. p. 1 *et seq.*).

Reviewed by A. Puton, Pet. Nouv. vi. pp. 420 & 421. 322 species are enumerated, including one treated as new, and several hitherto considered exclusively southern.

SCOTT, J. On a collection of Hemiptera-Homoptera from Japan. Descriptions of various new genera and species. Ann. N. H. (4) xiv. pp. 289-304, 360-365, 426-452.

Without reckoning some few undetermined insects, the author enumerates 101 species, of which 49 are new (5 European, and 3 British). They are contained in 85 genera (4 new); and, from the fact that 32 families are entirely unrepresented in the collection (made by Mr. G. Lewis), it is evident that this is simply the skeleton of an Hemipterous Fauna-list of the country.

SIEBKE, H. Enumeratio Insectorum Norvegicorum. Fasciculus I. Catalogus Hemipterorum et Orthopterorum continens. Univ.-Program for andet Semester 1874. Christiania: 1874, 8vo, pp. i.-xii. 1-52 (referring to the *Hemiptera*).

388 species of *Hemiptera* are noticed from Norway (none new).

STÅL, C. Enumeratio Hemipterorum. Bidrag till en Förteckning öfver alla hittills kända Hemiptera jemte systematiska meddelanden. Pt. 4. Sv. Ak. Handl. xii. No. 1, pp. 3-186.

Enumerates the *Reduviidæ* of Europe, Africa, Asia, and Australia, and the extra-European *Lygæidæ*. Of the *Reduviidæ*, in addition to the divisions relating to European species mentioned in Zool. Rec. ix. p. 412, the following are employed:—Sub-families *Holoptilina* (*Holoptilus*, A. & S., and allies), *Apiomerina* (*Diaspidius*, Westw., &c.), *Hammatocerina* (no genera mentioned), *Ectrichodiina* (*Ectrichodia*, Burm., &c.), *Salyavatina* (*Salyavata*, A. & S., &c.), *Tribelocephalina* (*Tribelocephala*, &c.), and *Bactrodina* (no genera mentioned). The *Emesina* now include as divisions the *Placariaria*, *Leistarcharia*, *Emesaria*, and *Metapteraria*. The *Berytidæ* are included, as sub-family *Berytina*, in the *Lygæidæ*, in which family, besides the groups mentioned in Zool. Rec. ix. p. 407, the following are also employed:—Sub-family *Pachygronthina*, and divisions *Cleradaria* (*Clerada*, Sign., &c.) and *Lethæaria* (*Lethæus*, Dall., &c.) of *Myodochina*, and division *Colobathristina* (*Colobathristes*, Burm.) of *Heterogastrina*.

The observations made in Zool. Rec. x. p. 446, apply also to this part.

WALKER, F. Catalogue of Hemiptera Heteroptera in the British Museum. Supplement. London: 1873, 8vo, pp. 1-63.

Although three separate volumes of this Catalogue (643 pages!) were published in 1873 by the Museum authorities, reaching to the end of the *Heteroptera*, the author found it necessary to add this supplement (not

published by the Museum), which (p. 63), he states does *not* include 'all the additional species,'—another supplement being intended.

In the preface, the 56 families employed by the author are enumerated, and a sketch of the modifications in structure of the *Heteroptera* is given. The part now being noticed discusses alterations and corrections in, and additions to, the former British Museum Catalogues, up to the *Apiomeridae*, the 41st of the author's families. These appear to be almost entirely adaptations of Stål's work: nothing new is described.

Further notes on resemblance to ants among the *Hemiptera*; J. W. Douglas, Ent. M. M. xi. p. 138.

European localities for various species; A. Puton, Ann. Soc. Ent. Fr. (5) iv. p. 230.

On species likely to occur in Britain; J. W. Douglas, *l. c.* p. 41.

Denmark. J. C. Schiödte, Nat. Tids. (3) vii. [1871], p. 540, and viii. [1873], pp. 480 & 481, gives localities for 6 and 19 species new to the fauna.

Tyrol. P. V. Gredler adds to the list of recorded species; Verh. z.-b. Wien, xxiv. pp. 553–558. A few particulars, &c., are given.

Biskra. The Hemipterous fauna (114 species known) is a mixture of the Mediterranean and purely African faunas; Bull. Soc. Ent. Fr. (5) iv. ccxlviii.

Quebec. List of species; Nat. Canad. iii. pp. 136–139.

SCUTATA.

Coreomelas nigritarsis, Garb., = *scarabœoides*, L.; *Odontotarsus nigricornis*, Garb., = *grammicus*, L., var.; A. Puton, Ann. Soc. Ent. Fr. (5) iv. pp. 225.

Scutellara semipunctata, F., var. n. *persica*, from Persia; P. M. Ferrari, Hem. Ag. Lig. p. 7, note.

Cydnus zophosoides, Ramb., = *pilosus*, H.-S.; *Sehirus rotundipennis*, Dohrn., = *6-maculatus*, Ramb.; A. Puton, Ann. Soc. Ent. Fr. (5) iv. pp. 225. *Cydnus morio*, Fall., F. Sahlb., nec. L., = *Sehirus luctuosus*, Muls. & R.; O. M. Reuter, *tom. cit.* p. 559.

Gnathoconus concolor, Muls. & R., var. n. *cyaneonitens*, from Diano Marina (queried as a good species); P. M. Ferrari, *l. c.* p. 11.

Sciocoris umbrinus, Ramb., *auritus*, Muls. & R., = *maculatus*, Fieb.; A. Puton, *l. c.* p. 225. *S. auritus*, M. & R., var. n. *obscurus*, Genoa; P. M. Ferrari, *l. c.* p. 11.

Holcostethus jani, Fieb., = *analisis*, Costa; *Nezara submarginata*, St., *incerta*, Sign., = *heegeri*, Fieb.: A. Puton, *l. c.* p. 225.

Acanthosoma griseum. Notes on egg-laying and young larvæ; J. Hellins, Ent. M. M. xi. p. 42.

Elia rostrata, Boh., var. n. *glebana*, Monte Rosa; P. M. Ferrari, *l. c.* p. 13.

Carpocoris lynx, F., var. n. *decolor*, Serravallo Scrivia; *id. l. c.* p. 16.

New species :—

Phimodera tuberculata, Jakowleff, Bull. Mosc. xlviii. pt. 1, p. 229, Astracan.

Trigonosoma halophila [-lum], id. l. c. p. 232, pl. x. fig. 1, Astracan.

Eurygaster nicoletianensis [-letensis], Provancher, Nat. Canad. iv. (1872) p. 73, Canada.

Scotinophora tarsalis, J. Scott, Ann. N. H. (4) xiv. p. 292, Japan.

Tarisa dimidiatipes and *leprosa*, Puton, Pet. Nouv. vi. p. 452, Biskra.

Picromerus lewisi, J. Scott, l. c. p. 293, Japan.

Perillus marginatus, Provancher, l. c. p. 74, Canada.

Æthus leptospermi (A. White), A. G. Butler, Zoology of Voyage of Erebus and Terror, ii. Insects, p. 25, pl. vii. fig. 3, New Zealand; *Æ. nigropiceus*, J. Scott, l. c. p. 294, Japan.

Cydnus rugosus, Jakowleff, l. c. p. 235, Astracan; *C. dilutus*, P. M. Ferrari, l. c. p. 9, Persia.

Macroscytus japonensis, J. Scott, l. c. p. 294, Japan.

Canthophorus niveimarginatus, id. l. c. p. 295, Japan.

Schirus 3-guttatus, id. l. c. p. 296, Japan.

Drinostia lewisi, id. *ibid.*, Japan.

Sciocoris convexiusculus, Puton, Pet. Nouv. vi. p. 439, Algeria.

Dictyotus polysticticus (A. White), A. G. Butler, l. c. p. 26, pl. vii. fig. 5, New Zealand.

Brochymena 4-notata, Provancher, l. c. p. 74, Georgia.

Ælia fieberi, J. Scott, l. c. p. 297, Japan.

Plantia stali, id. l. c. p. 299, Japan.

Nezara antennata, id. *ibid.*, Japan.

Palomena rubricornis, id. l. c. p. 300, Japan.

Acanthosoma scutellata [-tum], id. l. c. p. 301, Japan.

Elasmucha putoni, p. 302, *signoreti*, p. 303, id. l. c., Japan.

Brachynema melanota [-tum], Jakowleff, l. c. p. 240, Astracan.

Urostylis striicornis, p. 360, *annulicornis*, p. 361, *westwoodi*, p. 362, J. Scott, l. c., Japan.

SUPERICORNIA.

Phyllomorpha livingstonii, Westw., fig. 2, *pellicula*, Westw., fig. 3; J. O. Westwood, Thesaurus entomologicus oxoniensis, p. 190, pl. xxxvi.

Coreus difficilis, Voll., = *Ceraleptus squalidus*, Fieb., D. & S., *nec* Costa, = *lividus*, Stein; J. W. Douglas, Ent. M. M. x. p. 277.

Myrmidius flavidus, Costa, = *Prionotylus brevicornis*, Muls. & R.; A. Puton, Ann. Soc. Ent. Fr. (5) iv. p. 225.

Ceraleptus bellieri, Sign., *leptocerus*, Fieb., = *squalidus*, Costa; *Cymus beticus*, Ramb., = *Macevethus errans*, F.: id. l. c. pp. 225 & 226.

Tetrarhinus, g. n., Provancher, Nat. Canad. iv. (1872), p. 75. *Stenocephalide*; between *Stenocephalus* and *Leptocoris*, but with 4 points terminating the head in front. *T. quebecensis*, sp. n., id. l. c. p. 76, Quebec.

Paraplesius, g. n., J. Scott, Ann. N. H. (4) xiv. p. 364. *Coreide*;

closely allied to *Micrellytra*, Lap., but shape of head and length of joints of antennæ different. *P. unicolor*, sp. n., *id. ibid.*, Japan.

Homæocerus striicornis, sp. n., *id. l. c.* p. 362, Japan.

Plinactus bicoloripes, sp. n., *id. l. c.* p. 363, Japan.

Stenocephalus marginatus, Persia, *setulosus*, Serravalle Scrivia, spp. nn., P. M. Ferrari, Hem. Ag. Lig. p. 26.

Phyllomorpha indica, sp. n., Westwood, *l. c.* p. 190, pl. xxxvi. fig. 1, E. India.

Centrocarenus annæ and *degener*, spp. nn., Puton, Pet. Nouv. vi. p. 435, Biskra.

Terapha nigridorsum, sp. n., *id. ibid.*, Algeria.

BERYTIDÆ.

Berytus vittatus, Fieb. (forma macr.), *commutatus*, D. & S., *feberi*, Dohrn, *clavipes*, Hahn, F. Sahlb., = *minor*, H.-S., in which dimorphism occurs; *B. pygmaeus*, Reut., = *geniculatus*, Fieb. : O. M. Reuter, Ann. Soc. Ent. Fr. (5) iv. pp. 559 & 560.

Neides decurvatus, Uhler, = *gracilipes*, St. ; C. Stål, Sv. Ak. Handl. xii. No. i. p. 128.

Hoplinsus, g. n., *id. l. c.* p. 127; for *Neides spinosissimus*, Sign.

Berytus pygmaeus (Fieb., ined.), Lethierry, Cat. Hém. Dép. Nord, edn. 2, p. 12, note, Lille; *B. pygmaeus* (Fieb., ined.), p. 146, Stazzano, *striola*, p. 144, Genoa, *distinguendus*, p. 148, Stazzano, P. M. Ferrari, Hem. Ag. Lig. [see *antæa*, p. 467, as to date of publication] : spp. nn.

PYRRHOCORIDÆ.

Dindymus bipustulatus, sp. n., C. Stål, *l. c.* p. 168, Zanzibar.

Pyrrhocoris tibialis, *id. ibid.*, and *P. coriaceus*, J. Scott, Ann. N. H. (4) xiv. p. 440, Japan : spp. nn.

LYGÆIDÆ.

The following observations, amongst others, occur in Stål's "Enumeratio Hemipterorum," 4, Sv. Ak. Handl. xii. No. 1, pp. 98-170 [where no author's name is appended, the genus or species is to be referred to Stål]:—*Oncopeltus rubricatus* ? = *Lygæus nigriceps*, Dall., var. ; *L. sordidus*, Dall., = *O. 4-guttatus*, F., var. ; *L. alternans*, H. S., = *varicolor*, F., var. ; *L. 4-guttatus*, Dall., nec F., re-named *femoralis*, p. 102; *L. fairmairii*, Sign., and *convergens*, Dall., = *L. furcatus*, F., varr. ; *Lygæodon*, Put., = *Spilostethus*; *Lygæus lemniscatus* = *3-lineatus*, F. var. ; *L. fecialis* = *rivularis*, Germ. ; *L. squalidus*, Montr., = *familiaris*, F. ; *L. spinipes*, Sign., = *festivus*, Thun. ; *L. elatus* = *formosus*, Blanch. ; *L. stollianus* = *proximus*, Dall. ; *L. bitransversus*, Sign., *rubescens*, and *flavimarginellus*, = *Melanocoryphus bicrucis*, Say ; *Pyrrobaphus* is raised from sub-generic to generic rank ; *Apterola*, Muls., = *Graptostethus*, raised to generic rank ; *Lygæus ornatus*, Uhler, = *G. servus*, F., of

which *manillensis* is a var.; *Cymus franciscanus* = *Ischnorhynchus didymus*, Zett.; *Bedus* = *Cymodema*, Spin.; *Micropus brevicornis* is an *Ischnodemus*, and re-named *curticornis*, p. 131; *Blissus oblongus* re-named *longirostris*, p. 132; *Hæmus* = *Epipolops*, H. S.; *Ophthalmicus luniger*, Fieb., = *Geocoris punctipes*, Say; *O. lateralis*, Fieb., *niger*, Dall., = *G. uliginosus*, Say; *Peliosoma*, Uhler, *Dilophos*, Montr., = *Pachygrontha*, Germ.; *Plociomerus diffusus*, Uhler, = *Ligyrocoris sylvestris*, L., of which *Pamera contracta*, Say, is a var.; *Plociomeria piligera* = *L. abdominalis*, Guér.; *Paromius*, Fieb., *Gyndes*, and *Diplonotus*, = *Pamera*, Say; *Plociomerus vinulus* = *Pamera parvula*, Dall.; *P. vicinus* re-named *crassicornis*, p. 150; *P. ochroceras* = *bilobata*, Say; *Rhyparochromus caffer* re-named *Pachymerus (Elusmolomus) mendicus*, p. 161.

Lasiocoris crassicornis, Luc., is distinct from *anomalus*, Kol.; *Notochilus abeillii*, Put., = *Pterotmetus crassicornis*, Bär., = *Thaumastopus mitellatus*, Costa; *Rhyparochromus alpinus*, Garb., is an *Eremocoris*; *Phygadicus graminis*, Garb., = *Orsilius depressus*, Muls. & R.; *Engistus bruki*, Fieb., = *boops*, Duf.; *Scolopostethus obscurus*, Garb., = *Tropidostethus holosericeus*, Scholtz; *Macrodeima nigrum*, Sign., = *micropterum*, Curt.; *Piezoscelis antennatus*, Sign., = *staphylinus*, Ramb.; *Peritrechus rufipes*, Garb., = *Stygnocoris sabulosus*, Schill.; *Trapezonotus psammobius*, Garb., ♀, = *agrestis*, Fall.; *Beosus rhombimacula*, Costa, = *saturnius*, Rossi; *Brachyplax tenuis*, Muls. & R., *albidus*, Fieb., = *palliatu*, Costa; *Microplax dimidiatus*, Fieb., = *albo-fasciatus*, Costa: A. Puton, Ann. Soc. Ent. Fr. (5) iv. pp. 215-226.

Cymus glandicolor, Hahn, var. *major*, Schill., *caricis*, Fall., = *clavicus*, Fall., Zett., F. Sahlb.; *C. clavicus*, Hahn, Flor, Fieb., is re-named *aridellus*; *Scolopostethus podagricus*, Fall., pt., = *pictus*, Schill.; *Lygæus melanocerus*, Thoms., *Sc. ericetorum*, Leth., *affinis*, Fieb., *podagricus*, Flor, Fall., pt., = *Sc. decoratus*, Hahn; *L. podagricus*, Thoms., *Sc. adjunctus*, D. & S., *S. affinis*, var. *b*, Stål, *L. podagricus*, Flor, pt., *decoratus*, var., Hahn, *podagricus*, var. *b*, Fall., = *Sc. affinis*, Schill.; *Lygæus decoratus*, Thoms., nec Hahn, is re-named *thomsoni*; *L. affinis*, Thoms., nec Schill., is re-named *pilosus*: O. M. Reuter, Ann. Soc. Ent. Fr. (5) iv. pp. 560-562.

Ophthalmicus albipennis, F., varr. nn. *pallescens*, *humeralis*, and *costalis* from Stazzano; P. M. Ferrari, Hem. Ag. Lig. p. 43.

Plinthisus flavipes, Fieb.?, varr. nn. *pubescens* and *brevicollis*, Genoa; id. l. c. p. 44.

Tropidostethus holosericeus, Scholtz, varr. nn. *fasciatus* and *subfasciatus*, Genoa; id. l. c. p. 48.

Cymus melanocephalus, Fieb., in England; E. Saunders, Ent. M. M. xi. p. 62.

New genera and species:—

Stål, l. c., characterizes the following:—

Scopiastes, p. 98; *Lygæaria*, for *Astacops degeeri*.

Æthalotus, ibid.; *Lygæaria*, for *Astacops afzeli*.

Erythriscchius, p. 102, subg. of *Oncopeltus*, for *O. aulicus*, F., &c., and *O. (E.) longirostris*, ibid., S. America, *semilimbatus*, Brazil, and *cingulifer*, Honduras, Mexico, p. 103.

Hæmobaphus, subg. of *Lygæus*, p. 104, for *L. concinnus*, Dall.

Melanopleurus, subg. of *Lygæus*, p. 105, for *L. bistriangularis*, Say, &c., and *L. (M.) tetraspilus*, Cuba, and *belfragii*, Texas, p. 109.

Craspeduchus, subg. of *Lygæus*, p. 105, for *L. xanthostaurus*, H. S., and *L. (C.) nigro-limbatus*, New Granada, and *uhleri*, Mexico, p. 109.

Ochrostomus, subg. of *Lygæus*, p. 105, for *L. pulchellus*, F., &c., and *L. (O.) pyrrhopterus*, p. 110, Mexico, *disseptus* and *dispar*, p. 110, *subcarnatus*, p. 111, New Granada.

Ochrimnus, subg. of *Melanocoryphus*, p. 113, for *Lygæus collaris*, F., *L. vittiscutis*, and *M. (O.) mimulus*, *ibid.*, Texas.

Acroleucus, p. 99, next after *Melanocoryphus*; for *Lygæus coxalis*, &c., and *A. signoreti*, p. 114, Brazil, *vittaticeps*, *nigro-vittatus*, and *signaticollis*, p. 114, *hæmopterus*, *flaviseptus*, and *nobilis*, p. 115, Bogotá.

Hæmatorrhytus, p. 99, next before *Arocatus*; for *Lygæus discoidalis*, Sign.

Aspilocoryphus, p. 99, next before *Lygæosoma*; for *Cimex mendicus*, F., &c., and *A. australicus*, p. 117, N. Australia.

Ontiscus, p. 123; *Cymina*, *Ischnorhyncharia*, for *O. australis*, N. Australia, and *longicornis*, Philippine Isles, p. 124.

Pylorgus, p. 123, next *Ischnorhynchus*; for *Cimex colon*, Thunb.

Crompus, p. 124, next *Pylorgus*; for *C. oculatus*, p. 125, N. Australia.

Imbrius, p. 124, next *Crompus*; for *I. ferruginosus*, p. 125, New Granada.

Arphnus, p. 125; *Cymaria*, for *Oxycarenus coriaceipennis*.

Gonystus, p. 126; ends the *Cymaria*, for *G. nasutus*, p. 127, N. Australia, Fiji.

Hoplinus [see BERYTIDÆ].

Spalacocoris, p. 129; *Blissina*, for *S. sulcifer*, p. 130, Malacca.

Uttaris, p. 138; *Pachygronthina*, next after *Teracrius*, for *Ischnodemus pallidipennis*.

Crophius, p. 141; *Oxycarenina*, for *Lygæus disconotus*, Say, and *Cymus bohemani*.

Bedunia, p. 144; *Myodocharia*, next after *Ligyrocoris*, for *B. cuspidata*, Philippine Isles, and *insularis*, Samoa, p. 146.

Carpilis, p. 145; *Myodocharia*, following *Cnemodus*, H. S., for *Carp. ferruginea*, p. 153, Texas.

Pamphantus, p. 155; *Rhyparochromaria*, following *Cattarus*, for *P. elegantulus*, p. 157, Cuba.

Tempyra, p. 155; between *Polycrates* and *Astemmoplitis*, Spin., for *T. biguttula*, p. 157, Texas.

Salacia, p. 156; follows *Astemmoplitis*, Spin.; for *Aphanus diluticornis* and *pusio*, and *S. pilosula*, p. 158, Texas.

Dinia, p. 156; next *Salacia*, for *D. glabrata* and *polita*, p. 158, Philippine Isles.

Phorcinus, p. 160, subg. of *Pachymerus*, St. F.; for *Beosus albofasciatus*.

Naphius, p. 160, subg. of *Pachymerus*, St. F.; for *Rhyparochromus apicalis*, Dall.

Mævius, p. 163; *Lethæaria*, next *Platygaster*, for *M. indecorus*, p. 165, Australia.

Cistalia, p. 164; follows *Lethæus*, Dall., for *Lygæus signoreti*, Guér. and *Rhyparochromus albo-annulatus*.

Cryphula, p. 164; *Lethæaria*, following *Androgeus*, for *C. parallelogramma*, p. 165, Texas.

Esuris, p. 164; next to *Cryphula*, for *Rhyparochromus terginus*.

Chauliops, J. Scott, Ann. N. H. (4) xiv. p. 427. Between *Nysius* and *Henestaris*; minute, posterior margin of corium S-shaped, femora toothed. *C. fallax*, id. l. c. p. 428, Japan.

Metochus, id. l. c. p. 433. Associated with *Diplonotus*, but with toothed coxæ, differently toothed anterior femora, and straight anterior tibiae. *M. abbreviatus*, id. l. c. p. 434, Japan.

Prosomæus, id. l. c. p. 435. Nearest *Paramius*, Fieb. *Pr. brunneus*, id. l. c. p. 436, Japan.

Brachypterna, Jakowleff, Bull. Mosc. xlviii. pt. 1. p. 247. Facies of *Henestaris*; also allied to *Ophthalmicus* and *Engistis*. *B. salina* (name omitted from description), p. 248, pl. x. fig. 2, Astracan.

Hyalocoris, id. l. c. p. 250. Near *Lasiocoris*. *H. pilicornis*, p. 253, pl. x. fig. 3, Astracan.

Platychilus, id. l. c. p. 256. Allied to *Ischnopeza*. *P. dilaticollis*, p. 259, pl. x. fig. 4, Astracan.

Stål, l. c., describes the following:—

Astacops viridiventris, p. 100, Cape York.

Oncopeltus sexmaculatus, p. 102, Mexico.

Lygæus (*Graptolomus*) *kalmi*, N. America, *inequalis*, New Granada, p. 107.

Melanocoryphus pusio and *obscuripennis*, p. 112, Texas, *nigrinervis*, p. 112, Venezuela, *nigritutulus*, p. 113, Mexico.

Arocatus ænescens, p. 115, Australia.

Nysius (*Ortholomus*) *longiceps*, N. America, *callifer*, New Granada, p. 120.

Ischnorhynchus denticollis, Columbia, *pictipes*, New Granada, p. 124.

Cymus luridus, *angustatus*, p. 126, *breviceps*, p. 127, N. America, *tabidus*, p. 126, Bengal.

Ischnodemus nigripes, New Granada, *punctiger*, Uruguay, p. 131.

Epipolops quadripinus, p. 134, New Granada.

Geocoris scudderi, Texas, *flavilineus*, New Granada, p. 135, *discopterus*, *limbatus*, p. 136, New Jersey.

Cedancala cubana, Cuba, *meridionalis*, S. Brazil, *notata*, New Granada, p. 139.

Pachygrontha cedancalodes, p. 139, Mexico, *longiceps*, p. 140, New Granada.

Ligyrocorys multispinus and *balteatus*, p. 145, Mexico.

Myodocha longicollis, p. 146, Mexico, *unispinosa*, p. 147, La Guayra.

Heræus plebeius, New Jersey, *cincticornis*, New Granada, p. 147.

Pamera trivialis, New Granada, *capicola*, Cape of Good Hope, *curvipes*, S. Carolina, *linearis*, Argentine States, p. 148, *limbata*, *pacifica*, Ovalau, *costalis*, New Granada, p. 149, *globiceps*, New Granada, *setosa*, *nitidicollis*,

Texas, p. 150, *ferruginosa*, *crassiceps*, Prince Island, Gulf of Guinea, p. 151, *intermicrus*, p. 152, Philippine Isles.

Plociomeria fuscicornis, p. 152, *puberula*, p. 153, Texas, *tumens*, p. 153, New Granada.

Fonteius collaris, p. 154, Sydney.

Trapezonotus rufipes, p. 159, Texas.

Pachymerus (Graptopeltus) japonicus, p. 160, Japan.

Dieuches atricornis, p. 161, Australia.

Pocantius lineatus, p. 162, Philippine Isles.

Platygaster japonicus, p. 164, Japan.

Lethæus spinipes, p. 165, Cayenne.

Colobathristes burmeisteri, p. 168, Brazil.

Melanocoryphus fulvescens, A. Puton, Pet. Nouv. vi. p. 452, Biskra.

Arocatus melanostoma, J. Scott, l. c. p. 426, Japan.

Nysius longicornis, Puton, l. c. p. 439, Biskra; *N. saintcyri*, Provancher, Nat. Canad. iv. (1872) p. 77, Canada.

Plociomerus calcaratus, Puton, l. c. p. 436, Algeria, Vaouluse.

Proderus bellevoiyii, id. l. c. p. 452, Syria.

Geocoris thoracicus, *cardinalis*, *hispidulus*, id. *ibid.*, Biskra.

Ophthalmicus persicus, P. M. Ferrari, Hem. Ag. Lig. p. 41. Persia (? = *siculus*, Fieb., var.).

Plinthisus (Plinthisomus) ptilioides, Puton, l. c. p. 452, Syria; *P. longipennis*, p. 44, Stazzano, *mellæ*, Legnano, *marginatus*, Persia, p. 45 (the first and last queried), Ferrari, l. c.

Megalonotus hungaricus, G. v. Horváth, Pet. Nouv. vi. p. 455, Buda Pesth; *M. nitidicollis*, p. 213, Corsica, *colon*, p. 214, pl. vii. fig. 5, Syra, A. Puton, Ann. Soc. Ent. Fr. (5) iv.; *M. setosus*, id., Pet. Nouv. vi. p. 440, Algeria.

Rhyparochromus punctatus, Provancher, l. c. p. 76, Canada.

Scolopostethus ericetorum, Lethierry, Cat. Hém. Dép. Nord, 1869, p. 24, Lille [= *affinis*, Schill.].

Blissus doriæ, P. M. Ferrari, l. c. Spezia, Hyères.

Ischnodemus stapsylinus [? *staphylinus*], Jakowleff, l. c. p. 244, Astracan; *I. spinicaput*, Scott, l. c. p. 426, Japan.

Tropidostethus antennatus, Scott, p. 429, Japan.

Lasiosomus pallipes, id. *ibid.*, Japan.

Eremocoris icaunensis, Populus, Cat. Hém. Dép. Yonne, p. 28, France: ? = (*Rhyparochromus*) *alpinus*, Garb.; A. Puton, Pet. Nouv. vi. p. 421.

Diplonotus rusticus, p. 430, *hemipterus*, p. 431, *luridus*, *lateralis*, p. 432, Scott, l. c., Japan.

Gyndes albimarginatus, id. l. c. p. 437, Japan.

Lethæus dallasi, id. l. c. p. 438, Japan.

Calyptonotus (Raglius) albimaculatus, id. l. c. p. 439, Japan.

ANTHOCORIDÆ.

Lyctocoris rubicundus, Garb., *ex. typ.*, and *Cardiastethus curraz*, Garb., = *L. domesticus*, Sch.; *Brachysteles pilicornis*, M. & R., = *parvicornis*,

Costa; *Cardiastethus flavicans* and *fusciventris*, Garb., *testaceus*, Perr., = *rufescens*, Costa; A. Puton, Ann. Soc. Ent. Fr. (5) iv. p. 228.

Brachysteles foveolatus, sp. n., L. Lethierry, Cat. Hém. Dép. Nord, edn. 2, p. 39, Lille.

CAPSIDÆ.

O. M. Reuter, Öfv. Ak. Förh. 1874, No. 4, pp. 45-49, describes and mentions new Swedish species.

Calocoris rubro-marginatus, Luc., = *6-punctatus*, F., var.; *C. rubricosus*, Garb., *flavo-marginatus*, Donovan., = *Lopus mat*, Rossi; *Capsus apicalis*, Sign., = *cordiger*, Hahn, var.; *Cyphodema trikenia*, Costa, = *instabile*, Luc.; *Stiphrosoma obscurum*, Ramb., = *obesum*, Perr., var.; *Globiceps rugicollis*, Costa, = *coarctatus*, Muls. & R.; *Phytocoris gracilis*, Ramb., = *Orthocephalus flavo-marginatus*, Costa; *Apocremnus perrisi*, Muls. & R., = *variabilis*, Fall.; *Auchenocrepis foreli*, M. & R., = *minutissimus*, Ramb.; *Phytocoris pygmaeus*, Ramb., = *Macrolophus costalis*, Fieb.; *Orthotylus pellucidus*, Garb., *Litocoris annulicornis*, Sig., = *Agalliaestes verbasci*, H.-S.; *Ag. ocularis*, M. & R., = *modestus*, Mey.; *Amblytylus frontalis*, M. & R., = *albidus*, Hahn: A. Puton, Ann. Soc. Ent. Fr. (5) iv. pp. 227 & 228. *Macrocoleus paykuli*, Fall., var. n. *nigripes*, from Grenoble & Tyrol; *id. l. c.* p. 221.

Deræocoris fornicatus, Dougl. & S., = *striatellus*, F., var.; J. Scott, Ent. M. M. xi. p. 117.

Phytocoris pini, Kirschb., from Scotland; J. W. Douglas & J. Scott, Ent. M. M. xi. p. 144.

Capsus 3-fasciatus, L., var. n. *ultramontana*, Tyrol; P. V. Gredler, Verh. z.-b. Wien, xxiv. p. 556.

Lopus lineolatus, Brullé, = *mat*, Rossi, var.; L. Lethierry, Cat. Hém. Dép. Nord, edn. 2, p. 30.

Dioncus neglectus, F., varr. nn. *lateralis* and *flavescens*, Serravallo; P. M. Ferrari, Hem. Ag. Lig. p. 67. *Plagiorhamma suturale*, H.-S., ♀ described; *id. l. c.* p. 71.

Orthocephalus parallelus, Meyer, is different from *O. minor*, Costa; A. Puton, Pet. Nouv. vi. p. 440.

Oncotylus pilosus, D. & S., = *Macrocoleus solitarius*, Mey., var.; J. W. Douglas, Ent. M. M. x. p. 277.

Collaria, g. n., Provancher, Nat. Canad. iv. (1872) p. 79. Of the general facies of *Miris*; head produced in a very marked neck behind the eyes. *C. meilleuri*, sp. n., *id. ibid.*, Canada.

Allocotus, g. n., Puton, *l. c.* p. 218. Next *Litocoris*, but with the head keeled behind, the pronotum shorter and wider, and the rostrum shorter. Somewhat the facies of *Atractotomus*. *A. rubidus*, sp. n., *id. l. c.* p. 219, Metz; var. *moncreaffi*, Douglas & Scott, Ent. M. M. xi. p. 147, England.

Hadrophyes, g. n., Puton, *l. c.* p. 219. Near *Megalodactylus*, but with 2nd joint of tarsus longer than last joint, more perpendicular face, &c. *H. sulphurella*, sp. n., *id. l. c.* p. 220, France.

Plagiotylus, g. n., J. Scott, Ent. M. M. x. p. 272. Somewhat allied to *Pachylops*, Fieb., from which its flat, low crown, and convex, perpen-

dicular face will distinguish it. *Pl. maculatus*, sp. n., Scott, *l. c.* p. 273, Torla.

Myrmecoris saundersi, sp. n., Puton, *Pet. Nouv.* vi. p. 452, Greece.

Miris vicina, p. 77, *belangeri* and *viridis*, p. 78, spp. nn., Provancher, *l. c.* Canada.

Phytocoris artemisiæ, P. M. Ferrari, *Hem. Ag. Lig.* p. 64, Stazzano ; *P. salsolæ*, Puton, *Pet. Nouv.* vi. p. 436, Biskra : spp. nn.

Rhopalotomus rubronotatus, sp. n., Provancher, *l. c.* p. 105, Canada.

Capsus flavonotatus, p. 103, *flavipes*, p. 104, spp. nn., *id. l. c.* Canada.

Lygus brunneus and *dorsalis*, p. 104, *fuscus* and *unicolor*, p. 105, spp. nn., *id. l. c.* Canada.

Litosoma douglasi, sp. n., E. Saunders, *Ent. M. M.* xi. p. 63, England.

Orthocephalus coracinus, p. 217, figs. 6 & 7, S. Europe, *alutaceus*, p. 218, fig 1, Madrid, spp. nn., Puton, *Ann. Soc. Ent. Fr.* (5) iv. pl. vii.

Oncotylus pulchellus, sp. n., O. M. Reuter, *Øfv. Ak. Förh.* 1874, No. 4, p. 48, Stockholm.

Psallus punctulatus, Puton, *l. c.* p. 220, pl. vii. fig. 4, Ste. Baume, Var ;

P. lapponicus, O. M. Reuter, *l. c.* p. 47, Lapland : spp. nn.

Auchenocrepis albo-scutellatus, sp. n., Puton, *Pet. Nouv.* vi. p. 440, Biskra.

Macrocoleus gracilis, p. 221, Hérault, *lepidus*, p. 222, pl. vii. fig. 3, Sarepta, Hérault, spp. nn., *id.* *Ann. Soc. Ent. Fr.* (5) iv.

TINGIDÆ.

C. Stål, *Øfv. Ak. Förh.* 1874, No. 3, pp. 43-59, tabulates the European genera, indicating and partially describing some as new.

A list of 48 Hungarian species ; G. von Horváth, *Pet. Nouv.* vi. p. 432.

Critical observations on species described by Thomson in *Opusc. Ent.* iv. ; J. W. Douglas, *Ent. M. M.* x. p. 187, *et seq.* ; J. Sahlberg, *tom. cit.* p. 242 [see Reuter, *infra*].

Monanthia pallida, Garb., = *grisea*, Germ. ; *M. ajugarum*, Frey, = *ragusana*, Fieb. ; *M. pilifera*, Garb., = *setulosa*, Fieb. ; *M. oblonga*, Garb., = *costata*, F. ; *M. reticulata*, Ramb., = *lupuli*, Kze. ; *M. kiesewetteri*, Muls. & R., = *villosa*, Costa ; *Dictyonota fieberi*, Fieb., = *fuliginosa*, Costa ; *Monanthia erythrocephala* and *lurida*, Garb., = *Dictyonota crassicornis*, Fall. ; *D. aubei*, Sign., = *albipennis*, Bär. ; *D. pulchella*, Costa, = *marmorea*, Bär. ; *Acalypta biseriata*, Thoms., = *gracilis*, Fieb. : A. Puton, *Ann. Soc. Ent. Fr.* (5) iv. pp. 226 & 227.

Agramma latum, Flor, nec Fall., = *Serenithia femoralis*, Thoms. ; *Tingis affinis*, H.-S., F. Sahlb., = *Galeathus spinifrons*, Fall. ; *T. spinifrons*, H.-S., nec Fall., is re-named *G. angusticollis* ; *Acalypta cassidea*, Stål, Thoms., *Tingis cassidea*, Fall. ?, = *Acalypta cervina*, Fieb. ; *Orthostira intermedia*, Flor, = *A. platychila*, Fieb. ; *O. pusilla*, Fall., = *A. nigrina*, Fall., forma brachypt. ; *O. cylindricornis*, Thoms., *pusilla*, Fieb., nec Fall., *cinerea*, Flor, nec Fieb., = *A. macrophthalma*, Fieb. ; *O. obscura*, Fieb., = *A. parvula*, Fall. ; *O. recticosta* and *biseriata*, Thoms., *parvula*, Flor ?, = *A. gracilis*, Fieb. ; *Campylostira brachycera*, Fieb., = *verna*, Fall. : O. M. Reuter, *Ann. Soc. Ent. Fr.* (5) iv. pp. 562-565.

Cantacader staudingeri, Bär., var. n. *doriae*, Spezzia; P. M. Ferrari, Hem. Ag. Lig. p. 56.

Scraulia, g. n., Stål, l. c. p. 50. Hemelytral areolæ unequal, head spined at base. *Dictyonota fieberi* and *strichnocera*, Fieb., &c.

Biskria, sub-g. n. of *Dictyonota*. A. Puton, Pet. Nouv. vi. p. 440. Antennæ analogous to those of *Acalypta*; reticulation of elytra as in *Scraulia*. *D. (B.) gracilicornis*, sp. n., *id. ibid.*, Biskra.

Elasmotropis, g. n., Stål, l. c. p. 54. Type, *Monanthia echinopsidis*, Fieb.

Lasiotropis, g. n., *id. l. c.* p. 55. *Monanthia grisea*, Germ., &c., and *M. trichonota*, Puton.

Dictyla, g. n., *id. l. c.* p. 57. Type, *Monanthia platyomia*, Fieb.

Zosmenus porcatus, sp. n., G. v. Horváth, B. E. Z. xviii. p. 332, Pesth.

Cantacader lethierrii, sp. n., J. Scott, Ann. N. H. (4) xiv. p. 443, Japan.

Acalypta nigrinervis, sp. n., Stål, l. c. p. 52, Spain.

Agramma depressa [-sum], Jakowleff, Bull. Mosc. xlviii. pt. 1, p. 265, pl. x. fig. 6, Sarepta; *A. minutum*, G. v. Horváth, B. E. Z. xviii. p. 333, Ofner Mountains: spp. nn.

Anomaloptera setulosa, sp. n., Jakowleff, l. c. p. 261, pl. x. fig. 5, Astracan.

Monanthia (Platychila) trichonota, Puton, Ann. Soc. Ent. Fr. (5) iv. p. 216, Avignon; *M. nassata*, *id.*, Pet. Nouv. vi. p. 436, Algeria, Corsica, Spain; *M. monstrosa*, p. 441, *fieberi*, p. 442, J. Scott, Ann. N. H. (4) xiv. Japan; *M. flavipes*, G. v. Horváth, B. E. Z. xviii. p. 334, Hungary: spp. nn.

Dictyonota putoni, sp. n., Stål, l. c. p. 50, Algeria.

Tingis pyrioides, sp. n., J. Scott, l. c. p. 440, Japan.

Orthostira propinqua, sp. n., Ferrari, Hem. Ag. Lig. p. 58, Serravalle Scrivia.

Campylostira parvula, sp. n., *id. l. c.* p. 59, Persia.

ARADIDÆ.

O. M. Reuter, Cefv. Ak. Förh. 1872, No. 5, pp. 47-62, describes the Scandinavian and Finland species.

Aradus lucasi, Costa, = *flavo-maculatus*, Luc.; A. Puton, Ann. Soc. Ent. Fr. (5) iv. p. 227.

Aradus sareptanus, Jakowleff, Bull. Mosc. xlviii. pt. 1, p. 268, pl. x. fig. 7, Sarepta; *A. bimaculatus*, Reuter, l. c. p. 58, Småland; *A. sordidus*, G. v. Horváth, B. E. Z. xviii. p. 335, Hungary: spp. nn.

Mezira scabrosa, sp. n., J. Scott, Ann. N. H. (4) xiv. p. 444, Japan.

REDUVIIDÆ.

The following observations, amongst others, occur in Stål's "Enumeratio Hemipterorum," 4, Sv. Ak. Handl. xii. No. 1, pp. 16-97 [where no author's name is appended, the genus or species is to be referred to Stål]: —*Helonotus tuberculatus*, A. & S., *Reduvius tuberculatus*, Guér., *Lanittus*

vulnerans, = *H. 6-spinosus*, F.; *Laphyctes trux* = *Archilochus 4-dens*, F.; *Harpactor cinnabarinus*, *miniatus*, *sobrinus*, *scenicus*, *nigripes*, and *sedulus*, = *Vitumnus scenicus*, varr.; *H. capicola*, and *Colliocoris griseus*, var. *sydnicus*, Mayr, = *Coranus papillosus*, Thunb.; *Coranus ægyptius*, H. S., nec F., is re-named *angulatus*, p. 20; *Phonoctonus subimpictus* = *immitis*, var.; *Rihirbus dentipes*, Mayr, = *trochantericus*; *Astinus modestus* = *m-album*, A. & S.; *Gastrophæus*, Costa, = *Epidæus*; *Pinrsus* = *Endochus*; *Dalyrta* = *Alcmena*; *A. angusta* = *spinifex*, Thunb.; *Trachylestes* = *Gminatus*, sub-g.; *Cydnocoris tagalicus* = *gilvus*, Burm., ♀; *C. melanopus* ? = *crocatus*, ♀; *Phemius rubripennis*, Mayr, *Reduvius frater* and *convivus*, and *Sphodronyttus erythrómelas*, = *S. erythropterus*, Burm., varr.; *Cosmosphodrus* = *Sycanus*, A. & S., sub-g.; *S. generosus* = *stali*, Dohrn, var.; *S. cardinalis* and *pyrrholomus* = *fulvicornis*, Dohrn, varr.; *Phemius tuberculifer* and *consobrinus* = *tibialis*, Westw.; *Homalosphodrus* = *Parsialis*, but is retained; *Reduvius subcrispus* = *Velinus nodipes*, Uhler; *V. satellitius* = *nigrigena*, A. & S.; *Sphedanolestes lividigaster*, Muls., is re-named *lividiventris*, p. 33; *Sphactes*, *Lissonyctes*, and *Graptosphodrus*, = *Sphedanolestes*, sub-gg.; *Dinocleptes*, *Agrioclopius*, and *Aprepolestes*, = *Reduvius*, F., sub-gg.; *Glymmatophora* and *Ectrichodia* = *Physorhynchus*, A. & S., sub-gg.; *Ectrychotes gigas*, H. S., = *Physorhynchus lucidus*, St. F., var.; *Larymna* = *Ectrychotes*, Burm.; *Sphinctomerus*, Mayr, = *Adrania*; *Lestomerus* and *Catamiarus*, A. & S., *Fusius*, *Microsandalus*, *Melanolestes*, *Brachysandalus*, *Cleptocoris*, and *Spilodermus*, = *Pirates*, Serv.; *P. stridulus* and *bipunctatus*, F., = *hybridus*, Scop.; *Ectomocoris*, Mayr, *Callisphodrus*, *Macrosandalus*, and *Sphodrocoris*, = *Eumerus*, Klug; *Ect. coloratus*, Mayr, = *Eum. 4-guttatus*, F.; *Pirates flavo-pustulatus* = *Eum. maculicrus*, Fairm.; *P. 3-fenestratus* = *Eum. 4-maculatus*, Serv.; *P. fuscicornis*, Dohrn, = *Eum. atrox*, var.; *Dichrastropis*, Mayr, = *Androclius*; *Durganda fuscipes* = *rubra*, Lap., var.; *Clopophora* = *Phonergates*; *Psytala* = *Platymiris*, Lap.; *Plat. robbianus*, J. A. Smith, = *P. horrida*; *Mardania* = *Acanthaspis*, A. & S.; *Aphleps*, Fieb., = *Pasira*; *Holotrichius* ? *denudatus*, Costa, = *tenebrosus*, Burm., ♀, and *laportii* and *maurus*, Fieb., *cyrilli*, Costa, and *laportei*, Brullé, are its ♂; *Lisarda javana*, Mayr, = *apetala*, Vuill.; *Enusa* = *Lisarda*; *Harpagochares* = *Sastrapada*, A. & S.; *Ctenocnemis flavescens*, Fieb., = *S. bærensprungi*; *Thelocoris asper*, Mayr, = *Agylla nigricans*; *Bæbius* = *Oncocephalus*, Klug; *Emesodema*, Spin., = *Cerascopus*, Heinek.; *Carambis* deposited in favour of *Metapterus*, Costa; *Leptomera*, Montr., ? = *Acanthothorax*, Costa.

Harpactor perrisi, Muls. & Rey, = *carnifex*, M. & R., var., and ? = *Reduvius maurus* and *tibialis*, F.; *Coranus revellierii*, Muls. & R., = *Harpactor affinis*, Luc., = *H. niger*, Ramb.; *Coranus niger*, Fieb., nec Ramb., is re-named *feberi*; *Oreada denudata*, Muls. & R., = *Holotrichius cyrilli*, Costa, ♀, and *Oreada* must be abandoned as a genus; *Pirates ambiguus*, M. & R., = *hybridus*, Scop., var.; *Prostemma fuscipenne*, M. & R., = undeveloped *guttula*; *Emesa mantiformis*, M. & R., = *Metapterus linearis*, Costa: A. Puton, Ann. Soc. Ent. Fr. (5) iv. pp. 231-234.

Holoptilus nebulosus, Stål, p. 191, fig. 5. *vulpes*, St., p. 193, fig. 6, re-described and figured; J. O. Westwood, Thesaurus ent. oxon. pl. xxxvi.

H. (Orthocnemis) basalis, W., *H. (Ptilocnemus) lemur* and *fuscus*, W., hemelytra figured; *id. l. c.* figs. 12-14.

O. M. Reuter, *Cefv. Ak Förh.* 1872, No. 6, pp. 59-66, describes the Scandinavian and Finland species, and, *tom. cit.* pp. 67-77, particularly discusses the *Nabides*. A further contribution to the general knowledge of the latter groups is given, *tom. cit.* pp. 79-95 [the new species are recorded in *Zool. Rec.* x. p. 459], pl. viii., on which the '*hamus copulatorius*' of 18 species of *Nabis* is figured. *N. ferus*, F. Sahlb., *nec* L., renamed *minor*; *id. l. c.* p. 76. *N. caffra*, Stål, *capsiformis*, Germ., = *longipennis*, Costa; *id. Ann. Soc. Ent. Fr.* (5) iv. p. 565.

Plecuria ambigua, Nat. ?; undeveloped individuals from Stazzano described. P. M. Ferrari, *Hem. Ag. Lig.* p. 81.

Stål, *l. c.*, characterizes the following new genera, sub-genera, and species:—

Aulacosphodrus (*Cefv. Ak. Förh.* xxvii. [1870] p. 690, note), subg. of *Sphedanolestes*, St., p. 33. Type, *Reduvius leucocephalus*, F.

Hemactus, p. 34; subg. of *Sphedanolestes*. For *Reduvius nigroruber*, Dohrn, and *H. trichrous*, East Indies, and *compressipes*, Sumatra, *ibid.*

Zostus, p. 37, for *Harpactor varipes*, Sign., = *Reduvius acutus*, P. B.; *Hypertolmus*, *ibid.*, for *R. nitidulus*, F., *bellicosus*, St. (*marginatus*, Fairm., *nec* F.), and *R. transversus*, Sign., = *mæstus*, H. S., = *obtusus*, P. B., of which *bituberculatus*, St., is a var.; *Diphymus*, *ibid.*, for *R. bicolor*, F., and 8 other species; *Chirillus*, p. 38, for *R. marginatus*, F., and 2 other species; *Lamphrius*, p. 39, for *R. marginellus*, F. (of which *R. vicinus*, St., is a var.), and *mendicus*, St.; *Harpiscus*, *ibid.*, for *Harpactor tropicus*, H. S., and 6 other species; *Teniorphus*, p. 40, for *H. latro*, St., and 3 other species; *Charontus*, p. 41, for *R. (C.) longifrons*, *ibid.*, Pondicherry: subgg. of *Reduvius*.

Campylorhyncha [St., 1870], p. 42, subg. of *Tegea*, St. [not included in list of new genera, &c., in *Zool. Rec.* viii., though recorded at p. 432].

Cleontes, p. 44. *Apiomerina*: allied to *Diaspidius*, Westw. Type, *D. dilatatus*, Sign.

Hematorrhopus, p. 49, subg. of *Physorhynchus*, for *Ectrichodia linnæi*, St., and P. (*H. tuberculatus*, *ibid.*, locality unknown (? = *linnæi*, ♀).

Horcimia, p. 78. Differs from *Acanthaspis*, and approaches *Velleius* [[]], in the 2nd joint of its antennæ being about four times longer than the 1st, and in its large eyes; from the latter it is distinguished by the pronotum and margin of the abdomen being unspined. Type, *Cerilocus*? *varians*, St.

Croschius, in table, p. 67; between *Sphedanocoris*, St., and *Voconia*, St., (*Acanthaspidina*). For *C. melanopterus*, p. 80, Australia.

Syberna, in table, p. 81; *Salyavatina*, between *Valentia* and *Lysarda*, St. For *S. gracilipes*, p. 82, Borneo.

Tomolus, p. 90, in table of *Tribelocephalina*, next *Opisthoplatys*, Westw. For *T. costalis*, *ibid.*, Sumatra.

Nagusta tuberosa, p. 15, Egypt.

Coranus callosus, p. 12, *granosus*, p. 20, Australia.

Endochus (Pnirsus) cinctipes, p. 23, N. Australia.

Sycanus rubricatus, p. 28, Cochin China, *lobatus*, p. 29, Gorontalo.

- Arcesius longiceps* and *breviceps*, p. 30, Salawatti.
Velinus crassicus, p. 31, Aru.
Sphecanolestes bellus, p. 34, Timor, Java.
Vesbius sanguinosus, p. 36, Java.
Physorhynchus carinulatus, p. 50, Central Africa.
Ectrychotes ænescens, p. 51, Philippine Isles.
Mendis crassicornis, Benkoelen, *bimaculicollis*, Gorontalo, *gulosa*, Philippine Isles, p. 52.
Santosia pallidipennis, p. 55, Tondano.
Pirates mundulus, Tranquebar, *singularis*, locality unknown, p. 58;
P. (Brachysandalus) melanolestoides, *borealis*, and *brevicoxis*, p. 60, Australia.
Eumerus flaviger, p. 61, N. India.
Phalantus africanus, p. 63, Senegambia.
Sminthus zonatus, Borneo, *femoralis*, Amboina, *fuscipennis*, locality unknown, p. 68.
Velitra philippina, Philippine Isles, *pallipes*, Tondano, *nigricrus*, New Guinea, p. 69.
Acanthaspis variegata, p. 71, Sangir, Bel Menado, *fasciata*, p. 72, Philippine Isles, *discifera*, *pustulata*, p. 73, *annulicornis*, *coranodes*, p. 74, N. E. India, *iracunda*, p. 74, Calabar, *conspersa*, Java, *pictifrons*, Natal, p. 75.
Edocla vittata, p. 76, Cape Territory.
Holotrichius obtusangulus, Greece, *rotundatus*, Palestine, p. 77.
Valentia compressipes, p. 82, Burmah.
Lisarda pallidispina, Malacca, *annulosa*, E. India, p. 83.
Sastrapada australica, p. 86, N. & E. Australia.
Oncocephalus fuscirostris, N. Australia, *denticulatus*, Caffraria, p. 87.
Canthesancus picticollis, p. 89, E. India.
Thodelmus trispinosus, Cochin China, *impicticornis*, N. Australia, p. 89.
Stenolemus bituberosus, p. 94, Australia.
Cerascopus geniculatus, p. 95, Melbourne.

Stalia, g. n., Reuter, Cefv. Ak. Förh. 1872, No. 6, p. 94; for *Nabis boops*, Schiödt.

Aradellus, subg. n. of *Holoptilus*; Westwood, Thesaurus ent. oxon. p. 193. Differs from *Holoptilus* proper, in its antennæ and legs having short squamose setæ, its thorax being 2-keeled on the back, with no rounded posterior lobes, its shorter and thicker legs, and hemelytra not longer than the abdomen. *A. cygnalis*, sp. n., *id. ibid.* pl. xxxvi. fig. 7, Swan River, Australia.

Holoptilus dimidiatus, fig. 8, Ternate, *burmannicus*, fig. 9, Burmah, *agnellus*, fig. 10, Penang, *viverra*, fig. 11, E. Indies, Westwood, l. c. p. 192, pl. xxxvi. spp. nn.

Reduvius albo-signatus, sp. n., Provancher, Nat. Canad. iv. (1872), p. 105, Georgia.

Darbanus georgiæ, sp. n., *id. l. c.* p. 106, Georgia.

Emesa corsicensis, sp. n., J. Scott, Ent. M. M. x. p. 270, Corsica.

Emesodema huttoni, sp. n., *id. l. c.* p. 271, New Zealand.

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Cerascopus (Emesodema) grassator, sp. n., A. Puton, Pet. Nouv. vi. p. 440, Biskra.

Acanthaspis humeralis, sp. n., J. Scott, Ann. N. H. (4) xiv. p. 444, Japan.

Mendis japonensis, sp. n., *id. l. c.* p. 445, Japan.

Pachynomus lethierryi, sp. n., A. Puton, Pet. Nouv. vi. p. 440, Biskra.

Nabis brevineatus, sp. n., J. Scott, *l. c.* p. 445, Japan.

SALDIDÆ.

Salda opacula, Flor, *nec* Zett., = (*Acanthia*) *marginalis*, Fall.; *S. costalis*, Thoms., is distinct from *costalis*, F. Sahlb., which = *opacula*, Zett.; *S. riparia*, Hahn, *nec* Fieb., Fall., Zett., Stål, is re-named *nigricornis*; *S. pallipes*, var. 1, F. Sahlb., is not *xanthochila*, as Fieber stated, but = *pallipes*, F., recently developed: O. M. Reuter, Ann. Soc. Ent. Fr. (5) iv. pp. 565 & 566.

Salda opacula, Zett., *S. marginella*, Fieb., and *S. fucicola*, J. Sahlb., new to Britain; J. W. Douglas, Ent. M. M. xi. pp. 9 & 142.

Leptopus dufouri, Sign., = *hispanus*, Ramb.; A. Puton, Ann. Soc. Ent. Fr. (5) iv. p. 228.

Sciodopterus bouchervillii, sp. n., Provancher, Nat. Canad. iv. (1872) p. 106, Canada (? = *Salda picea*, F., Say).

Salda major, *obscura*, and *variegata*, *id. l. c.* p. 107, Canada; *S. palustris*, p. 10, England, *vestita*, p. 11, England and Scotland, J. W. Douglas, *l. c.*: spp. nn.

HYDROMETRIDÆ.

Hydrometra fasciata, Sign., = *naias*, Deg. (alata); A. Puton, *l. c.* p. 229.

Limnobates albilineatus, sp. n., J. Scott, Ann. N. H. (4) xiv. p. 447, Japan.

Microvelia douglasi, sp. n., *id. l. c.* p. 448, Japan.

PELOGONIDÆ.

Pelagonus flavimarginatus, sp. n., *id. l. c.* p. 446, Japan.

NAUCORIDÆ.

Aphelochirus æstivalis at Bath; J. O. Westwood, Ent. M. M. xi. p. 16. In Norfolk, not uncommon, the winged form very rare; J. L. Brown, *l. c.* pp. 92, 117.

Naucoris exclamationis, sp. n., J. Scott, *l. c.* p. 449, Japan.

NEPIDÆ.

Appasus lewisi, sp. n., J. Scott, *l. c.* p. 450, Japan.

Laccotrephes japonensis, sp. n., *id. ibid.*, Japan.

Ranatra pallidinotata, p. 451, *unicolor*, p. 452, spp. nn., *id. l. c.* Japan.

CORIXIDÆ.

Corixa melanosoma, Fieb., = *scripta*, Ramb.; *C. graphiptera*, Ramb., = *atomaria*, Ill.; *C. hieroglyphica*, Ramb., = *stali*, Fieb.; A. Puton, *l. c.* p. 229.

Corixa 3-lineata and *2-lineata*, Provancher, Nat. Canad. iv. (1872) p. 108, Quebec; *C. vermiculata*, Puton, Pet. Nouv. vi. p. 440, Biskra; *C. frivaldskii*, G. v. Horváth, B. E. Z. xviii. p. 336, Pesth: spp. nn.

HEMIPTERA-HOMOPTERA.

Captures on the West Coast of Scotland; J. W. Douglas, Ent. M. M. xi. p. 118.

CICADIDÆ.

Tibicina bætica, Ramb., = *cisticola*, Géné; *Cicadetta helianthemis*, Ramb., = *argentata*, Ol.: A. Puton, Ann. Soc. Ent. Fr. (5) iv. p. 229.

Platypleura monographically treated, 52 species being recognized; A. G. Butler, Cist. Ent. pt. viii. pp. 183-198.

Platypleura fuscangulis, p. 189, Sarawak, *stalina*, p. 193, Sierre Leone (*limbata*, Stål, nec F.), *quadraticollis*, p. 194, Lake N'Gami, *P. (Oxypleura) acutipennis*, p. 195, Banda, *niveonotata*, p. 197, Lake N'Gami, *id. l. c.* spp. nn.

CERCOPIDÆ.

Aphrophora spumaria. Details of structure described and figured; J. O. Harper, Sci. Goss. 1874, pp. 52-54, figs. 43-47.

Cosmoscarta and *Phymatostetha* revised; 104 species of the first, and 22 of the latter, being recognized. *Cercopis nigripennis*, Walk., nec F., re-named *Cosm. megamera*, fig. 3; *Cerc. costalis*, Walk., ? = *theora*, White, var.; *Cerc. urvillii*, Walk., nec St. F., re-named *Cosm. australis*, fig. 12; *Cerc. nasalis*, Wlk., = *urvillii*, St. F.; *Cerc. undulifera*, Walk., *bis*, re-named *incanescens*, figs. 14 & 14a; *Cerc. decisa*, Walk. (*bis*), re-named *zonata*, fig. 15; *Cerc. unifascia*, Walk. (*bis*), re-named *horrifica*, fig. 17; *C. obtusa*, W., = *discrepans*, W.; *Tomaspis circumducta*, Stål, nec Walk., re-named *P. stali*; *T. costalis*, St., nec W., re-named *P. borneensis*: A. G. Butler, Cist. Ent. pt. x. pl. viii. pp. 245-270.

Ptyelus trimaculatus (A. White), A. G. Butler, Zoology of Voyage of Erebus and Terror, ii. Insects, p. 26, pl. vii. fig. 10, New Zealand; *P. albiceps*, Provancher, Nat. Canad. iv. (1872) p. 351, Canada: spp. nn.

Clastoptera saintcyri, sp. n., *id. ibid.*, Canada.

Cosmoscarta siamensis, fig. 1, Cambodia, *basinotata*, fig. 2, Sarawak, p. 246, *funeralis*, fig. 4, India, *wallacii*, fig. 5, Dorey, *flaccida*, fig. 6, Java, p. 247, *plutonica*, fig. 7, p. 248, Corea, *rutilans*, fig. 8, p. 249, Sarawak, *vilis*, fig. 9, Dorey, *consequens*, fig. 10, New Guinea, *ferociens*, fig. 11, Mysol, p. 250, *fervescens*, fig. 13, p. 252, Menado, *perstrigata*, fig. 16, p. 253, New Guinea, *pulchella*, p. 254, Laos, *chrysomelena*, p. 255,

Shanghai, Laos, *feralis*, p. 256, Sarawak, *fictilis*, p. 259, Penang, India, *papuensis*, New Guinea, *pellucida*, Laos, *timorensis*, Timor, p. 262, *inaurata*, Morty, *miranda*, Kaisa, p. 264, *elegantula*, p. 265, India, A. G. Butler, l. c.; *C. distantii*, id. P. Z. S. 1874, p. 672, Penang: spp. nn.

Phymatostetha inconspicua, Ceylon, *triseriata*, Laos, id. Cist. Ent. pt. x. p. 267, spp. nn.

MEMBRACIDÆ.

Membracis. Honey-exuding species attended by *Phidole*, and sucked in the absence of the latter by *Hypoclinea* (*Formicida*); T. Belt, Naturalist in Nicaragua, p. 227.

Tragopa brunnea, sp. n., Provancher, Nat. Canad. iv. (1872) p. 320, Canada.

IASIDÆ.

J. Scott, Ent. M. M. x. pp. 189-195, 235-242, continues his descriptions of the British species of *Bythoscopides*; *Pediopsis impura* and *fuscinervis*, Boh., *P. nana*, H. S., *Agallia brachyptera*, Boh., *Bythoscopus rufusculus*, Fieb., *Strongylocephalus agrestis*, Fall., *Doratura stylata*, Boh., new to Britain.

Athysanus nymphææ, Perris, = *Cicadula cyanæ*, Boh.; *Deltocephalus calceolatus*, Boh., = *bohemani*, Zett. varr.: A. Puton, Ann. Soc. Ent. Fr. (5) iv. pp. 229.

Alebra, fig. 1, *Notus*, fig. 2, *Chlorita*, fig. 3, *Cybus*, fig. 4, *Typhlocyba*, fig. 5, *Anomia*, fig. 6, *Zygina*, fig. 7; lower wing and various details figured by L. Lethierry, Cat. Hém. Dép. Nord, edn. 2, pl. i. p. 105.

Opsius, sub-g. n. of *Athysanus* [Fieber, Kat.; Zool. Rec. ix. p. 415], L. Lethierry, Pet. Nouv. vi. p. 449. Vertex semicircular; hemelytra with a rudimentary appendix. Connects *Thamnotettix* and *Athysanus*. *A. stactogulus*, Amyot, *heydeni*, Fieb., and *scutellaris*, *pallasi*, and *jucundus*, spp. nn., Lethierry, l. c. Biskra, Sarepta.

Cephalelus americanus, sp. n., Provancher, Nat. Canad. iv. (1872) p. 350, Canada.

Tettigonia quebecensis, id. l. c. p. 352, Quebec; *T. elvina*, A. G. Butler, P. Z. S. 1874, p. 673, Amazon district: spp. nn.

Ledropsis coccinea, sp. n., A. G. Butler, l. c. N. Australia.

Macropsis clitellarius [-ia] and *ocellatus* [-ta], spp. nn., Provancher, l. c. p. 377, Canada.

Idiocerus venustus, sp. n., J. Scott, Ent. M. M. x. p. 239, England.

Bythoscopus sanguinolentus and *4-punctatus*, spp. nn., Provancher, l. c. p. 376, Canada.

Pediopsis flavescens, id. *ibid.*, Canada; *P. distinctus* [-ta], p. 191, *tibialis*, p. 195, J. Scott, l. c. England: spp. nn.

Agallia intermedia, sp. n., L. Lethierry, Pet. Nouv. vi. p. 444, Biskra.

Typhlocyba lactea, p. 58, note, *rubro-vittata*, p. 59 note, id. Cat. Hém. Dép. Nord, 1869, Lille (the first referred to *Anomia*, the last to *Zygina*, *ericetorum*, Sahlb., being attributed to it as a synonym; id. op. cit. edn. 2, p. 67); *T. lelievrii*, id. op. cit. edn. 2, p. 72, note, Lille; *T. rosea*, Pro-

vancher, l. c. p. 378, Canada; *T. (Chlorita) fasciolata & biskrensis*, Lethierry, Pet. Nouv. vi. p. 449, Biskra: spp. nn.

Anomia norgueti, sp. n., Lethierry, Cat. Hém. Dép. Nord, edn. 2, p. 73, note, Abbeville.

Zygina angusta, sp. n., id. l. c. p. 76, note, Lille.

Eupteryx abrotani, sp. n., J. W. Douglas, Ent. M. M. xi. p. 118, Britain.

Athysanus minutepunctatus, sp. n., Lethierry, Pet. Nouv. vi. p. 449, Biskra.

Iassus aurantiacus, subcupreus, p. 377, *melanogaster, 6-punctatus, citronellus, nervatus*, p. 378, spp. nn., Provancher, l. c. Canada.

Thamnotettix albo-guttata & putoni, spp. nn., Lethierry, l. c. p. 444, Biskra.

Strongylocephalus megerlii, sp. n., J. Scott, Ent. M. M. xi. p. 122, England.

Acopsis viridis, sp. n., Provancher, l. c. p. 352, Canada.

Penthimia picta, sp. n., id. *ibid.*, Canada.

FULGORIDÆ.

Fulgora. List of 28 species known to science, with synonymy; A. G. Butler, P. Z. S. 1874, pp. 97-102.

Liburnia neglecta, Flor, = *fairmairii*, Perris, ♀; *L. cognata*, Fieb., = *aubæi*, Perr., ♂: A. Puton, Ann. Soc. Ent. Fr. (5) iv. p. 229. *L. perspicillata*, Boh., new to Britain; J. Scott, Ent. M. M. x. p. 270.

Haplacha, g. n., Lethierry, Pet. Nouv. vi. p. 444. 'Near *Cixius, Myndus*, and *Trichacus*. *H. seticulosa*, sp. n., id. *ibid.*, Biskra.

Fulgora brevirostris, p. 97, fig. 1, Penang (? = *candelaria*, L., local race), *gigantea*, p. 99, fig. 2, Sarawak, *stellata*, p. 100, fig. 3, Labuan, *pyrrhocolora* (Walker, ? described), p. 101, Sarawak, A. G. Butler, l. c. pl. xv.; *F. curtiprora*, Sikkim, *cardinalis*, Nepal, id. Ann. N. H. (4) xiv. p. 131: spp. nn.

Delphax unipunctata, p. 319, *furcata*, p. 320, spp. nn., Provancher, Nat. Canad. iv. (1872), Canada.

Liburnia putoni, sp. n., J. Scott, Ent. M. M. xi. p. 119, Biskra.

Hysteropterum angusticeps, sp. n., Lethierry, l. c. pp. 444, Biskra.

PSYLLIDÆ.

Psylla and *Trioza*. Neuration of upper wings figured and named; Lethierry, Cat. Hém. Dép. Nord, edn. 2, pl. ii. figs. 1 & 2, p. 105.

Diraphia viridescens, sp. n., Provancher, Nat. Canad. iv. (1872), p. 379, Canada.

Psylla ochracea and *brunnea*, id. *ibid.*, Canada; *P. triozaoides*, p. 89, note, Pas-du-Calais, *sylvicola*, p. 90, note, Valenciennes, Lethierry, l. c.: spp. nn.

Aphalara pallida, Lethierry, l. c. p. 95, note, Mormal; *A. salsolæ*, id. Pet. Nouv. vi. p. 449, Biskra; *A. targionii*, J. Lichtenstein, Bull. Soc. Ent. Fr. (5) iv. p. ccxxviii. Montpellier, Africa: spp. nn.

APHIDIDÆ.

Aphis rosæ and *mali*. Winged individuals occur from the commencement of the season, associated with the apterous form, and are sometimes quite as prolific as the latter, but are never found in the "fall"; the ♂ is very much smaller than the ♀, and copulation is described: T. G. Gentry, Am. Nat. viii. pp. 231-233. A ♀ *Aphis* on *Cucurbita ovifera* observed to feed its very young brood with honey-dew; general observations on the benefit of this excretion: *id.* Canad. Ent. vi. pp. 5-8.

On the capability of resisting cold, &c., by insects of this family, and on a large assemblage of eggs of *Lachnus quercus*; J. Lichtenstein, Bull. Soc. Ent. Fr. (5) iv. pp. cexli. & cexlii.

Lachnus piceæ and *Dryobius croaticus*, from Amurland; and observations on the autumnal close of *Aphis*-life and on *Aphis*-honey. F. Walker, Ent. vii. pp. 12 & 13.

Pemphigus poschingeri, sp. n., G. Holzner, S. E. Z. xxxv. pp. 221, 321-324, figs. 1-6, roots of fir trees (*Abies balsamica* and *fraseri*), Upper Bavaria.

Toxoptera scirpi, sp. n., G. Passerini, Bull. Ent. Ital. vi. p. 137, Parma, on *Scirpus lacustris*.

Phylloxera vastatrix.

A general bibliographical and biological account, with practical observations, and notices and figures of parasites; C. V. Riley, Rep. Ins. Mo. vi. pp. 30-65, figs. 2-17. *Cf.* also appendix, *l. c.* pp. 66-87, containing diagnoses of the mature forms. "The Grape Phylloxera," from the "Popular Science Monthly," pp. 1-16, 7 cuts, and "False Theories," from the New York Weekly Tribune, both by this author, have not been seen by the Recorder.

The commencement of a descriptive account of the insect and its ravages in the south-east of France; Nature, x. pp. 503-506, map. General observations, P. E. Soc. 1874, p. xxxviii. *et seq.* On its appearance at Geneva; Forel, *tom. cit.* p. xxvii.

In CR. lxxviii. & lxxix. (for 1874) are upwards of 220 notices referring to the *Phylloxera*, especially as to means for its destruction. These do not call for separate notice, being practically variations of the ideas discussed in Zool. Rec. x. p. 464. The following works, published in France, must however be here recorded:—

M. GIRARD: Le Phylloxera de la Vigne, son organisation, ses mœurs; choix des procédés de destruction. Paris: 1874, 12mo, pp. 1-119, with woodcuts, and maps of the districts affected. (Reviewed, Pet. Nouv. vi. p. 450). The maps are reproduced from DUCLAUX's "Études sur la nouvelle maladie de la vigne dans le S. E. de la France," Mém. des savants étrangers, xxii. No. 5. L. FAUCON: Mémoire sur la maladie de la vigne, et son traitement par la submersion; *op. cit.* No. 13. PEREZ: Groupe régional Girondin: Instruction élémentaire sur le Phylloxera. Bordeaux: 1874. E. FALIÈRES: Du Phylloxera et

d'un nouveau mode d'emploi des insecticides. Bordeaux: 1874. A. DUPONCHEL: Le *Phylloxera*, guérison probable de la vigne par un traitement préventif, physiologique et naturel. Montpellier; 1873. E. BLANCHARD: Le *Phylloxera* de la Vigne. Revue des Deux Mondes, Nov. 1, 1873. T. MALVEZIN: Letter to the Chamber of Commerce of Bordeaux, 1874. Practical instructions on the manner of observing the malady and the *Phylloxera*, addressed to viticulturists, have been published by the VISCOUNT MALHER, Prefect of the Department of Saône and Loire; and destructive agents noticed by ROHART, in "Le Cultivateur de Sud-ouest et du Centre," i. No. 12, p. 250. For general observations, cf. G. Mingaud, Bull. Soc. Sci. Lyon, i. p. 29.

The winged perfect insect observed, without previous copulation, to deposit two little sacs on the leaves of *Quercus coccifera*. The sacs soon open, a ♂ insect proceeding from one, and a ♀ from the other, and these at once copulate. The ♂ sac is single, but the ♀ is often double (as two pupæ are observed sometimes in one cocoon). The insects proceeding from those sacs or pupæ have no rostrum. J. Lichtenstein, Bull. Soc. Ent. Fr. (5) iv. p. clxxviii.

This statement received with doubt; the insects at all events are not *P. vastatrix*, but *P. lichtensteini*, Balbiani, and *P. corticalis*, Kalt. (? = *rileyi*, Licht.). Signoret, *tom. cit.* p. clxxxv. This observer has a vine on which he has ever since 1869 placed all the *Phylloxera* sent to him, and which is apparently none the worse for that treatment; p. clxxxvi.

Lichtenstein, *tom. cit.* pp. cxcviii.-cxi., states that Signoret (*suprà*) has confused "Kermès" *corticalis*, Kalt., which lives on the pine, with *Phylloxera corticalis*, Kalt., found on the oak. *P. lichtensteini*, Balb., = *corticalis*, Kalt., = *rileyi*, Licht., for which priority is claimed. [*P. rileyi* is merely mentioned in Rep. Ins. Mo. iv. 1872, p. 66, and was only described in 1874, and then by Riley, not Lichtenstein.] A tabulated list is given of the known species. Cf. Signoret, *l. c.* p. cccxxviii.

Numbers of individuals in all stages found in October, 20 centimetres below the surface; M. Girard, *tom. cit.* p. cccxxx.

Vitis vulpina, L., called "Scuppernong" in America, effectually resists the *Phylloxera*; J. Lichtenstein, *l. c.* p. xxiii.

Observations on the different portions of the tree affected by the same species in America and Europe; *id. l. c.* pp. liv. & lv.

Planchon's supposed parasite *Tyroglyphus (echinopus)*, Rob. & Fum.) has probably nothing to do with *Phylloxera*; Fumouze, *tom. cit.* p. xcvi.

Phylloxera quercus and *vastatrix*. Development and habits discussed by Gerstaecker, SB. nat. Fr. 1874, pp. 117-130.

Phylloxera quercus; general notes by F. Walker, Ent. vii. p. 208. Balbiani, CR. lxxviii. pp. 1024-1027, completes his account of its life-history by recording the discovery of the young *Phylloxera*, hatched in April from a fecundated egg laid in the preceding autumn.

A pseudo-*Phylloxera*, uniting the characters of the *Aphididæ* and *Coccidæ*, found among *Coccus aceris*; V. Signoret, Bull. Soc. Ent. Fr. (5) iv. p. cccxxxix.

Phylloxera rileyi (Lichtenstein), C. V. Riley, Rep. Ins. Mo. vi. pp. 64 & 86 (described), figs. 18 & 19, on oaks, N. America [cf. Pet. Nouv. vi. p. 379, and Zool. Rec. ix. p. 417]; *P. corticalis*, Kaltenbach, Pflanzenfeinde, 1873, p. 677; *P. balbianii* (= *quercus*, Fonsc., and *P. quercus*, Sign., = *coccinea*, Heyden; V. Signoret, Bull. Soc. Ent. Fr. 5, iv. p. ccxl.), on *Quercus coccifera*, and *P. bipunctatum* [-ta], Geneva, Bagnères de Bigorre, J. Lichtenstein, Bull. Soc. Ent. Fr. (5) iv. p. cc.; *P. lichtensteini*, Balbiani, CR. lxxix. p. 640, France [cf. *suprà*]: spp. nn.

COCCIDÆ.

V. SIGNORET, Ann. Soc. Ent. Fr. (5) iv. pp. 87–106 (pt. xii.), pp. 545–558 (pt. xiii.), pls. 3–12 (or xiii. & xiv. of the treatise as a whole), continues his "Essai sur les Cochenilles ou Gallinsectes." He discusses *Physokermes hemicryphus*, Dalm., pl. 3, fig. 1, *Ericerus pela*, Westw., fig. 2, *Lecanopsis rhizophila*, Targ., fig. 3, *L. ? radicum-graminis*, Bär. & Fonsc., *Aclerda*, g. n. (near *Lecanopsis*, but with no limbs in the adult), p. 96, for *A. subterranea*, sp. n., p. 97, fig. 4, S. France, *Fairmairia*, g. n. (covered by a shield composed of concentric circles), p. 98, for *F. bipartita*, sp. n., p. 99, fig. 5, S. France, *Carteria*, g. n., p. 101, for *Coccus lacca*, Kerr, fig. 6. These end the author's 'Lécánides.' The study of the 'Coccites,' or true *Coccus* of the ancients, is commenced with *Kermes ballotæ*, sp. n., p. 548, pl. 12, fig. 1, *K. bauhinii*, Planch., fig. 2, *K. gibbosus*, sp. n., p. 552, fig. 3, from Vienna, *K. pallidus* and *reniformis*, Réaum., *K. variegatus*, Gm., fig. 4, and *K. vermilio*, Planch., fig. 5. The author defends his adoption of *Kermes* as a generic name, and, *op. cit.* Bull. pp. cclvii. & cclviii., gives an analysis of pt. xv. of this work, comprising the 'Dactyloplites.' Some new species are named (but not described) and *Ripersia*, *Westwoodia*, and *Iceya* indicated as new genera.

J. Lichtenstein, *op. cit.* Bull. p. cci., notes that Signoret in 1869 placed the genus *Chermes* in the *Aphididæ*, and points out the confusion likely to arise from using the word *Kermes* here. Signoret replies, *l. c.* p. ccxxxix.

Cochineal observed in considerable quantities on *Cactaceæ* in the N. Western part of Nebraska and adjacent part of Dakota; E. P. Austin, *Psyche*, i. p. 30.

Coccus guarded by stinging ant (*Solenopsis*); T. Belt, *Naturalist in Nicaragua*, p. 226.

Mytilaspis pomicorticis, Riley. The author denies that this species is *pomorum*, Bouché, as Packard has stated; Am. Nat. viii. p. 185.

Aspidiotus conchiformis. Observations on habits, &c.; Nat. Canad. ii. pp. 112–117.

(ANOPLURA.)

PEDICULIDÆ.

C. G. GIEBEL, *Insecta Epizoa* [*suprà*, pp. 239 & 543], pp. 21–47, gives a general account of the structure and literature of this group, which contains the following genera:—

Antennæ 5-jointed.

Thorax and abdomen not sharply separated *Phthirius*, Leach.

Thorax and abdomen sharply separated.

Thorax gradually reaching the width of the abdomen *Pediculus*, Linn.

Thorax narrower than the large abdomen *Hæmatopinus*, Leach.

Antennæ 3-jointed *Pedicinus*, Gervais.

Phthirius inguinalis, Redi (*pubis*, L.), pl. i. fig. 8, *Pediculus vestimenti*, Nitz., pl. i. fig. 5, *capitis*, Nitz., pl. i. figs. 1 & 2, *Pedicinus eurygaster*, Gerv., pl. i. fig. 3, *Hæmatopinus sphaerocephalus*, Denny, pl. i. fig. 4, *serratus*, Denny, pl. i. fig. 6, *acanthopus*, Nitz., pl. ii. fig. 3, *clavicornis*, Nitz., *leucophæus*, Burm., *hispidus* and *læviusculus*, Grube, *spinulosus*, Nitz. (*denticulatus*, Nitz.), pl. i. fig. 7, *spiniger*, Denny, pl. ii. fig. 1, *affinis*, Denny, pl. i. fig. 9, *lyriocephalus*, Burm. (*lyriceps*, Nitz.), pl. ii. fig. 2, *piliferus*, Burm. (*canis-familiaris*, Müll., *isopus* and *flavidus*, Nitz.), *crassicornis*, Redi, pl. ii. fig. 7, *eurysternus*, Nitz., pl. ii. fig. 8, *setosus*, Burm. (*phocæ*, Luc.), *tenuirostris*, Burm. (*vituli*, L., *oxyrhynchus*, Nitz.), pl. ii. fig. 9, *brevicornis*, sp. n., p. 43, from *Camelopardalis giraffa*, Amsterdam, *stenopsis*, Burm. (*schistopygus*, Nitz.), pl. ii. fig. 4, *macrocephalus*, Nitz. (*asini*, L.), pl. ii. fig. 5, *urius*, Mufet (*suus*, L.), pl. ii. fig. 6, *tuberculatus*, Nitz., and *ventricosus*, Denny, are described and (where indicated) figured. *Hæmatopinus reclinatus*, Nitz., *spiculifer*, *phthiriopsis* (*buffali*, Deg.), and *saccatus*, Gerv., *cameli*, Redi, and *leptocephalus*, Ehrenb., are also briefly discussed. The alimentary canal of *H. lyriocephalus* is figured, pl. xx. fig. 1.

POLYCTENIDÆ.

This family is proposed by Westwood, *Thesaurus ent. oxon.*, for the reception of the genus *Polyctenes*, characterized by him at p. 198, and including *P. fumarius*, sp. n., pl. xxxviii., parasitic on the bat *Molossus fumarius*, from Jamaica, and *P. molossus* (Westw. & Giglioli), pls. xxxix. & xl., parasitic on *M. chinensis*. Both possess a haustellum, very similar in form to that of the genuine *Hemiptera-Heteroptera*, and are set with rows of strong flat spines. It seems doubtful whether, in a more advanced stage of growth, the dorsal scales in these species might not be further developed into elytra or hemelytra.

VERMES.

BY

C. F. LÜTKEN, PH.D., F.R.D.A., &c.

I. ROTATORIA.

1. LEIDY, J. Remarks on the revivification of *Rotifer vulgaris*. P. Ac. Philad. 1874, pp. 88 & 89. Reproduced, Am. J. Sci. (3) viii. pp. 223 & 224; Ann. N. H. (4) xiv. p. 316.

When Rotifers become inactive during drought, they may be revived by being supplied with moisture; but when they have been really dried up, they cannot be revived [*cf.* Zool. Rec. x. p. 467].

Limnias socialis (? sp. n.; ? = *L. ceratophylli*, var.), *id.* P. Ac. Philad. 1874, p. 140, R. Schuyllkill.

2. MÖBIUS, K. Ein Beitrag zur Anatomie des *Brachionus plicatilis*, Müll., eines Räderthieres der Ostsee. Z. wiss. Zool. xxv. pp. 103–113, pl. v.

A full account of the anatomy of the female *Brachionus plicatilis*, Müll. (*B. muelleri*, Ehrbg.).

II. CHÆTOPODA.

1. EHLERS, E. Annulata nova vel minus cognita in expeditione "Porcupine" capta. Ann. N. H. (4) xiii. pp. 292–298.
2. —. Beiträge zur Kenntniss der Verticalverbreitung der Borstenwürmer im Meere. Z. wiss. Zool. xxv. pp. 1–102 (with a posthumous report of É. Claparède, on the *Annulata* collected in the "Lightning" Expedition), pls. i.–iv. *Cf.* also Nature, xiii. p. 75; Arch. Sci. nat. lii. pp. 72–80.
3. EISEN, G. Om Skandinavians Lumbricider. Öfv. Ak. Förh. 1873, No. 8, pp. 43–56, pl. xii.
4. —. Bidrag till kännedom om New Englands och Canadas Lumbricider. *Op. cit.* 1874, No. 2, pp. 41–49, pl. ii.

5. (EISEN, G.) Om *Aulorhipis* och dess förmodade släktskap med Spongiorna. *Op. cit.* Bihang ii. 1, No. 3, 16 pp., pls. i. & ii.
6. GREEFF, R. Ueber die Organisation der Echiuriden. *SB. Ges. Marb.* 1874, pp. 21-30; abstract, *Z. ges. Naturw.* (2) xlviii. pp. 366-370.
7. GRUBE, E. Descriptiones Annulorum novorum mare Ceylonicum habitantium ab honoratissimo Holdsworth collectorum. *P. Z. S.* 1874, pp. 325-329.
8. —. Die Familie der Lycorideen und die Aufstellung von Gruppen in der Gattung *Nereis*. *JB. schles. Ges.* 1873, pp. 56-73.
9. MALM, A. W. Zoologiska observationer. VII. Annulater i hafvet utmed Sverges vestkust och omkring Göteborg. *Göteb. Handl.* (2) 1874, pp. 67-105, pl. i.
10. MCINTOSH, W. C. On the *Annelida* of the Gulf of St. Lawrence. *Ann. N. H.* (4) xiii. pp. 261-269, pls. ix. & x.
11. MARENZELLER, E. v. Ueber *Lagis* (*Pectinaria*) *koreni*, Mgr., aus dem Mittelmeere und die Hakenborsten der Amphicteneen. *Verh. z.-b. Wien*, xxiv. pp. 217-224.
12. —. Zur Kenntniss der adriatischen Anneliden. *SB. Ak. Wien*, lxix. pp. 1-76, pls. i.-vii.
13. MARION, A. F. Sur les Annélides du Golfe de Marseille. *C. R.* lxxix. pp. 398-401; translated, *Ann. N. H.* (4) xiv. pp. 313-315; abstract, *R. Z.* (3) ii. pp. lv. & lvi.
14. NOLL, F. C. Ueber einen neuen Ringelwurm des Rhins. *Arch. f. Nat.* xl. pp. 260-270, pl. vii.
15. PERRIER, É. Sur les Lombriciens terrestres exotiques des genres *Urochæta* et *Perichæta*. *C. R.* lxxviii. pp. 814-817; abstract, *R. Z.* (3) ii. pp. iv. & v.
16. —. Sur un nouveau genre indigène des Lombriciens terrestres (*Pontodrilus marionis*, E. P.). *Tom. cit.* pp. 1582-1586; abstract, *R. Z. l. c.* pp. viii. & ix.
17. —. Études sur l'organisation des Lombriciens terrestres. *Arch. Z. expér.* iii. pp. 331-530, pls. xii.-xvii.
18. TAUBER, P. Undersøgelser over Naidernes kjønsløse Formering. *Nat. Tids.* (3) ix. pp. 1-100, pls. i.-iii. A report to the R. Danish Academy on this prize essay in Overs. Dan. Selsk. 1874, pp. 21-28.

DISTRIBUTION, LOCAL LISTS, ETC.

W. C. MCINTOSH reviews the *Turbellaria*, *Chatognatha*, *Gephyrea*, *Discophora*, *Oligochæta*, and *Polychæta* of St. Andrews; *Ann. N. H.* (4) xiv. pp. 144-155, 192-307. G. EISEN gives a new list (3) of the Scandinavian earth-worms, and another (4) of the nine species found at Niagara and at Mount Lebanon, five of which are identical with Scandinavian species. F. VEJDOWSKY, a list of the *Discophora* and *Oli-*

gochaeta of Bohemia; SB. böhm. Ges. 1874, pp. 220-224. E. W. HUTTON points out the occurrence of two *Lumbrici* and one *Peripatus*, and 2-3 land-Planarians in New Zealand; Ann. N. H. (4) xiii. p. 95. K. MÖBIUS records twelve species of *Chætopoda* and a few other worms collected at East Greenland by the second German Polar Expedition; Zweite deutsche Nordpolarfahrt, ii. pp. 253-261, 1 pl. A. E. VERRILL continues his reports (4-7) "On the results of recent dredging expeditions on the coast of New England," Am. J. Sci. (3) vii. pp. 38-46, 131-138, 405-414, 498-505; cf. also A. E. VERRILL, "Exploration of Casco Bay by the U. S. Fish Commission in 1873," P. Am. Ass. 1873, pp. 340-395, pls. i.-vi., and J. S. WHITEAVES "on recent deep-sea dredging expeditions in the Gulf of St. Lawrence," Am. J. Sci. l. c. pp. 210-219, and "Notes on a deep-sea dredging expedition round the island of Anticosti, in the Gulf of St. Lawrence;" Canad. Nat. (n.s.) vii. p. 806. A. W. MALM (9) enumerates 10 species of *Oligochaeta*, from the vicinity of Gottenburg, and 169 *Chætopoda* from the Kattegat. The *Annulata* and lower worms collected at Spitzbergen and Nova Zembla are enumerated and partly described by E. EHLERS in T. v. Heuglin's "Reisen nach dem Nordpolarmeer in den Jahren 1870 und 1871," iii. pp. 238-256. A. F. MARION (13) & BOBRITZKY have observed 87 species of Chætopod Annelids in the Gulf of Marseilles, 18 of which are known from the Black Sea and 17 from the western coasts of France. É. CLAPARÈDE & EHLERS (2) discuss the relations between the abyssal *Annulata* and the fauna of the higher zones; it cannot be said that the fauna beyond the 300 fathom line has a very peculiar "facies." With the exception of *Teuthusa* and *Hermella*, all families of Northern Atlantic *Chætopoda* are represented, and the new species discovered at great depths may still be found elsewhere. The abyssal *Annulata* are comparatively small, chiefly "eurythermous" or arctico-boreal species; of blindness or absence of colours, that might be attributed to the absolute darkness of the depth, comparatively few instances could be cited, e.g., the blind *Syllis abyssicola*; the remarkable occurrence of *Oligochaeta* and *Nematoda* at the depth of 650 fathoms is pointed out. In the "Matériaux pour servir à l'étude de la faune profonde du lac Léman," published by F. A. FOREL, Bull. Soc. Vaud. xiii. pp. 1-164, pls. i.-iii., are enumerated as inhabiting the depths of this lake :—3 *Oligochaeta limicola* (1 *Tubifex*, 1 *Clitellio*, 1 *Lumbriculus*, all apparently new), *Piscicola geometra*, 3 *Turbellaria* (vide infra), 1 *Ligula*, several *Nematoda* (*Rhabditis*?, *Leptodera*?, *Ascarides*?), *Rotatoria* (*Floscularia*, *Brachionus*), and also *Hydra*, *Epistylis*, *Vorticella*, and *Acineta*. S. S. SMITH has contributed a "Sketch of the invertebrate fauna of Lake Superior" to Baird's Rep. U. S. Comm. Fisheries, 1872-73, pp. 690-707 (*Oligochaeta* 6, *Bellodea* 8, *Turbellaria* 1, *Hydra* 1), with a bathymetrical table.

ANATOMY, EVOLUTION, &c.

For H. N. MOSELEY's observations on the structure and development of *Peripatus capensis*, P. R. Soc. xxii. pp. 344-350, see MYRIOPODA [anted, p. 237].

MARION (13) p. 400, describes the sexual organs of *Saccocirrus*; there

are two copulatory organs on the dorsal side of each reproductive segment in the males; in the females, the oviducts occupy the same position, while the vulvæ (leading into the copulatory pouches) are placed on the ventral aspect. In *Leipoceras wiferum*, MÖBIUS has detected on the sides of the body, from the 18th segment onwards, tubercles, becoming racemose on the hinder segments: these are egg-bundles or external ovaries and the same segments have eggs on the inner surface of the body-wall. *Zweite deutsche Nordpolarfahrt*, ii. pp. 254 & 255.

In GREEFF's anatomical account (6) of *Echiurus pallasi* and *Thalassema baroni*, one of the chief points is, that the principal trunk of the nervous system, a single cylindrical string reposing immediately on the ventral surface of the inner circular muscular layer, is entirely without vestiges of ganglia, though it has been figured as a regular chain of ganglia. The cesophageal ring also is not existing, as described; but the abdominal string divides where it enters the spoon-shaped proboscis, the two branches uniting again at the broad end of this organ.

PERRIER'S "Études" (17) is the first—on the anatomy of *Urochæta*—of an intended series of papers devoted to the investigation of the exotic types of earth-worms; these may be studied conveniently in Europe, when sent in company with living plants for hot-houses, etc. Perrier draws attention particularly to the chapters treating of the systematical value of the characters furnished by the locomotive bristles, of the nature and physiological action of "Morren's glands," and of the circulatory apparatus. [A summary of the most important discoveries must be deferred until the intended series is concluded.] An abstract of Perrier's previous paper in *N. Arch. Mus.* viii. [*Zool. Rec.* ix. p. 467] is given in *J. Zool.* ii. pp. 213-216.

TAUBER (18) has studied the anatomy, histology, and asexual reproduction, &c., of the *Naidea*, especially of *Stylaria proboscidea*, *Nais elinguis*, *Chaetogaster limnei* and *C. diaphana*. His experiments on the artificial division and regeneration of these *Oligochæta* have confirmed those made by O. F. Müller a century ago. Taking as his starting-point a number of primary stem-animals, especially of *Nais elinguis*, developed direct from the egg, he has, for a year and a quarter, continued watching and carefully isolating each stem-animal (primary or secondary, &c.) from its chained offspring, ascertained several important and hitherto dubious facts concerning the so-called "transversal division" or "spontaneous fission" of these *Annulata*. A true "fission" or "division" however never takes place; the phenomenon to which this name has been given is, in fact, a gemmation, not only when, in the ordinary gemmation, segment after segment of the stem-animal is sacrificed for the formation of new "zooids," but also when (this process having attained its natural limit, and the consumed segments being reproduced) a new "division" apparently takes place through the formation of a new head in the middle of the elongated body; or when the same process is going on at the first division of the primary egg-hatched stem-Naid: the only difference is, that in the last instance the formation of the head, &c., is retarded relatively to the other segments. In the beginning of the second life-year, the primary stem-individuals acquire sexual maturity,

develop their sexual products, and die, and this is also successively the case with the stem-individuals of the secondary, tertiary, etc., chains; on the other hand, the three posterior zooids of the quadruple chain never will (*Chætog. diaphanus* excepted) produce heads, the limits between them and between the first and the stem-individual are obliterated, &c.

A note by J. H. EMERTON (Bull. Essex Inst. 1873, pp. 12-13) contains some very elementary observations on the worms of the genus *Nais*.

H. LUDWIG, Ueber die Eibildung im Thierreich, Verh. Ges. Würzb. (n.f.) vii. pp. 33-256, pls. i.-iii. (Arb. Inst. Würzb. i. pp. 287-510, pls. xiii.-xv.), discusses the formation of the eggs in the *Platyhelmintha*, pp. 49-67, *Nematoda*, pp. 66-78; *Echinorhynchi*, *Gephyrea*, &c., pp. 79-87, *Rotatoria*, pp. 87-89, *Chætopoda* and *Discophora*, pp. 91-111.

Genera and Species.

Chloeia ceylonica, sp. n., Grube (7), p. 236.

Harmothoe macleodi, sp. n., McIntosh, Ann. N. H. (4) xiv. p. 193;

Hermadion assimile, sp. n., id. l. c. p. 194.

Malmgrenia andreapolis, id. l. c. p. 195, St. Andrews, *whiteavesi*, id. (10) p. 263, pl. ix. figs. 5-7, Gulf of St. Lawrence, g. & spp. nn.

Letmonice kinbergi (Bd.), Ehlers (2), p. 31, pl. ii. figs. 1 & 2.

Lagisca rarispina, Sars, var. *occidentalis*, McIntosh, l. c., p. 262, pl. ix. figs. 1-4.

Antinoe sarsi (Kinb.), id. *ibid.*; Ehlers (2), p. 33, pl. ii. figs. 3 & 4; Heuglin, l. c. pp. 238-241. Specimens from the Baltic and Kattegat compared; Malm (9).

Eupolynoe occidentalis, p. 264, pl. ix. figs. 9-13, *anticostiensis*, p. 265, pl. x. figs. 1-4; McIntosh (10), spp. nn.

Nemidia (?) *canadensis*, p. 265, pl. x. figs. 5-8, *laurencii*, p. 266, pl. x. figs. 9-11, id. l. c., spp. nn.

Polynoe gaspænsis, sp. n., id. l. c. p. 267, pls. ix. figs. 14 & 15, x. figs. 12 & 13; *P. lamprophthalma*, sp. n., Marenzeller (11), p. 408, pl. i. fig. 1 [= *Lepidasthenia elegans*, Gr.], *reticulata*, Cl., id. l. c., p. 412, *crassipalpa*, sp. n., id. *ibid.*, pl. ii. fig. 1, *scolopendrina*, Sav. (*variegata*, Gr., Kr.), id. l. c., p. 419, *johnstoni*, sp. n., id. l. c., p. 420.

Acheloe astericola (Ch.), Marenzeller (12), p. 420.

Leanira hystricis, sp. n., Ehlers (1), p. 292, (2) p. 35, pl. ii. figs. 5-11; sp. n., near *L. yhleni* (Mgn.), McIntosh (10), p. 268, pl. x. fig. 14, *L. tetragona* (Örst.), id. *ibid.*

Enipo gracilis, sp. n., Verrill, Am. J. Sci. (3) vii. p. 407, pl. vi. fig. 4; P. Am. Ass. 1873, p. 378, pl. v. fig. 3.

Nephtys pansa, sp. n., Ehlers (1), p. 293, (2) p. 40, pl. iii. figs. 1 & 2, *johnstoni*, sp. n., id. (1) p. 293, (2) p. 38, pl. iii. figs. 3-7 (= *longisetosa*, Johnst. ?); *N. ingens*, Stimpson, P. Am. Ass. l. c. pl. ii. fig. 1; *N. emarginata*, p. 77, pl. i. fig. 1, *paradoxa*, p. 79, pl. i. fig. 2, Malm (9), spp. nn.

Eulalia tripunctata, sp. n., McIntosh, Ann. N. H. (4) xiv. p. 197; *E. imbricata*, sp. n., Ehlers (1), p. 294, (2) p. 43, pl. ii. fig. 15; *E. pistacia*, sp. n., Verrill, Am. J. Sci. vii. pl. v. fig. 2, P. Am. Ass. 1873, p. 380, pl. iv.

fig. 2; *E. (Eumida) pallida*, Cl., Marenzeller (11), p. 423; *E. (Pterocirrus) macroceros*, Gr. (*volucris*, Ehl.), *id. l. c.* p. 424.

Carobia lugens (Ehl.), *id. l. c.*, p. 426.

Eteone andreapolis, sp. n., McIntosh, *l. c.* p. 197; *E. cæca*, Ehlers (1), p. 294, (2) p. 42, pl. ii. figs. 12-14; *E. picta*, *id.*, in Heuglin's "Reisen," &c., pp. 250 & 251, Nova Zembla.

Eteonella robertiana, g. & sp. nn., McIntosh, *l. c.* Head conical, with a distinct furrow on each side; cephalic and buccal segments apparently united; two short filiform tentacles proceeding from the posterior part of the head, and the mouth opening in the cephalic segment; no visible eyes, &c.

Phyllodoce catenula, sp. n., Verrill, Am. J. Sci. (3) vii. pl. iv. fig. 5; P. Am. Ass. 1873, p. 382, pl. iii. fig. 1.

Sige macrocephala, sp. n., Malm (9), p. 80, pl. i. fig. 3.

Lacydonia miranda, g. & sp. nn., Marion (13), p. 399. Head provided with four small anterior appendages (palpi and antennæ); a single pair of tentacular cirri on the buccal ring; dorsal and ventral cirri pinniform; feet of the three anterior setigerous segments uniramous; those of the following provided with a dorsal oar of simple, and a ventral of composite, setæ; proboscis unarmed, short, placed between two tubular secretory apparatus of a very complicated nature, analogous to the lateral tubes in *Hydrophanus*.

Podarce agilis, Ehl. (*Mania*, Qutf.), Marenzeller (11), p. 428.

Ophiodromus roseus, sp. n., Malm (9), p. 82; *O. flexuosus* (Ch.) [= *O. fasciatus*, Gr., *vittatus*, Sars?, *stephania*, Cl.], Marenzeller (11), p. 429; *O. adpersus*, Grube, JB. schles. Ges. 1873, p. 54.

Hesione ceylonica, sp. n., Grube (7), p. 327.

Magalia perarmata, g. & sp. nn., Marion (13), p. 399. Antennæ 2, palpi 2, tentacular cirri 12, proboscis armed with two jaws and a stylet.

Gyptis, g. n., *id. ibid.* Proboscis unarmed; ? allied to *Oxydromus*.

Syllis brevicollis, sp. n., Ehlers (1), p. 292, (2) p. 44, pl. ii. figs. 16 & 17; *abyssicola*, *id.* (1), p. 292, (2) p. 45, pl. ii. figs. 18-20; *S. eximia*, sp. n., Malm (9), p. 83; *S. torquata*, sp. n., Marion (13), p. 399; *S. lussinensis* (Gr.), Marenzeller (11), p. 436, pl. iii. fig. 1; *S. vittata* (Gr.; *aurita*, Cl.), *id. l. c.* p. 441, pl. iii. fig. 2; *S. macrocola*, sp. n., *id. l. c.* p. 443, pl. iii. fig. 3 [= *hyalina*, Gr., *pellucida*, Ehl.].

Stephanosyllis ornata, sp. n., Verrill, Am. J. Sci. (3) vii. p. 132 (*S. picta*, *l. c.* p. 43), Casco Bay; P. Am. Ass. 1873, p. 378, pl. iv. fig. 1.

Grubea pusilla (Cl.), Marenzeller (11), p. 431; *G. dolichopoda*, sp. n., *id. l. c.* p. 432, pl. iv. fig. 1.

Trypanosyllis zebra (Gr.), *id. l. c.* p. 446, pl. v. fig. 1.

Odontosyllis virescens, sp. n., *id. l. c.* p. 447, pl. iv. fig. 1.

Pterosyllis lineata (Gr.), *id. l. c.* p. 450, pl. v. fig. 2; *P. plectorhyncha*, sp. n., *id. l. c.* p. 453, pl. v. fig. 3.

Gattiola cincinnata, Verrill, P. Am. Ass. 1873, pl. ii. fig. 1.

Eusyllis lamelligera and *Autolytus ornatus*, spp. nn. [names only], Marion (13), p. 399.

Proceræa gracilis, Verrill, Am. J. Sci. (3) vii. p. 132, P. Am. Ass. 1873, p. 372, pl. iii. fig. 9, Casco Bay; *P. luxurians*, p. 456, pls. vi. fig. 1, vii. fig. 1, *brachycephala*, p. 460, pls. vi. fig. 2, vii. fig. 2, Marenzeller (11): spp. nn.

Nereis (*Platynereis*) *festiva*, sp. n., Grube (7), p. 326; *N.* (*Ceratonereis*) *excisa*, sp. n., *id.* (8), *N. sieboldi* & *albipes*, spp. nn., *id. ibid.* (Desterro, all three); *Dendronereis pinnaticirris*, sp. n., *id. ibid.* (Philippines); *N.* (*Leonnates*) *virgatus*, sp. n., *id. ibid.* (Isl. Tatihou, La Manche); *N.* (*Hediste*) *diversicolor*, Marenzeller (11), p. 466, pl. vii. fig. 3.

In the family *Lycoridae*, only 5 genera are recognized by Grube (8): *Lycastis*, Sav., *Nereis*, L., *Ceratocephala*, Mgr., *Tylorrhynchus*, Gr., and *Dendronereis*, Pet. (*Micronereis*, Clap., is added, *op. cit.* 1874, pp. 79–80). The genus *Nereis* is subdivided after characters offered chiefly by the paragnatha as follows: — *Leptonereis*, Kb. [= *Nicon*, *Nicomedes*], *Leonnates*, Kb., *Ceratonereis*, Kb., *Platynereis*, Kb. [= *Leontis*, *Pisenoë*], *Lycoris*, Sav. [= *Nereis*, *Nereilepas*, *Cirronereis*, *Thoosa*, *Neanthes*, Kb., *Alitta*, *Hediste*, *Praxitheia*, Mgn., *Mastigonereis*, Schm.], and *Perinereis*, Kb. [= *Lipephile*, Mgn., *Arete*, *Pseudonereis*, *Paranereis*, *Perinereis*, *Naumachius*, Kb.]. All genera based upon a *Nereilepas*-, or a *Heteronereis*-state, e.g., *Eunereis*, *Hedyle*, *Iphinereis*, *Heteronereis*, *Nossis*, are of course rejected.

Diopatra brevibranchiata, sp. n., Ehlers (1), p. 295; (2), p. 49, pl. iii. figs. 11–21; *D. socialis*, sp. n., *id.* (1), p. 296, (2), p. 46, pl. iii. figs. 5–10 [= *Onuphis quadricuspis*, Sars].

Lumbriconereis obtusa, sp. n., Verrill, P. Am. Ass. 1873, p. 383; *L. fragilis*, *id.* Am. J. Sci. (3) vii. pl. iv. fig. 2, Ehlers (2), p. 53, pl. iii. figs. 22–32; *Nothria opalina*, Verrill, Am. J. Sci. (3) vii. pl. iv. fig. 1, P. Am. Ass. 1873, p. 381, pl. iv. fig. 4; *Ninoë nigripes*, *id.* Am. J. Sci. (3) vii. pl. iv. fig. 3, P. Am. Ass. l. c. p. 382, pl. iii. fig. 5; *Notocirrus tricolor* (Johnst.) (= *scoticus*, MacInt.), Ehlers (2), p. 55, pl. iii. fig. 33.

Marphysa fallax, sp. n., Marion (13); *M. bellii* (Qu.), Marenzeller (12), p. 465; *Eunice clapedii* (Quatr.), *id. l. c.* p. 461.

Glycera cinnamomea, sp. n., Grube (7), p. 327.

Armandia oligops, sp. n., Marenzeller (12), p. 470, pl. vii. fig. 4.

Ammotrypane fimbriata, Verrill, Am. J. Sci. (3) vii. pl. vii. fig. 1, P. Am. Ass. l. c. pl. ii. fig. 9.

Leipoceras, g. n., Möbius, Zweite Deutsche Nordpolarfahrt, ii. pp. 254 & 255, pl. i. figs. 10–20; Ann. N. H. (4) xiii. p. 200, pl. xi. figs. 4–17. *Spioideæ*; head without tentacles or tentacular cirri; 5th body-segment longer than the preceding and following segments, bearing on each side a comb-like series of thick setæ; branchiæ linguliform, on both sides of the back of the segments. *L. uviferum*, sp. n., *id. ibid.*

Heterospio longissima, sp. n., Ehlers (1), p. 296, (2), p. 60, pl. iv. figs. 10 & 11.

Aricia kupferi, sp. n., *id.* (1), p. 296, (2), p. 57, pl. iv. figs. 1–9.

Anthostoma acutum, Verrill, P. Am. Ass. 1873, p. 384.

Naidonereis quadricuspida, Ehlers (2), p. 59, pl. iv. figs. 28.

Pacilochaetus fulgoris, g. & spp. n., Claparède (2), pp. 9–13, pl. i. figs. 1A–D. Body composed of numerous (probably over 60) rings; skin granulated; cephalic lobe confluent with buccal segments, bearing 2 fans of long bristles, 1 antenna, and 1 pair of tentacular cirri; feet short, bi-ramose, with 1 dorsal and 1 ventral cirrus with swollen bases; on the 7–11th segments these cirri are longer and rigid; bristles partly plumose or

thick and covered by asperities (and then increasing in numbers backwards). Described by Claparède long ago in the larval state, but hitherto unknown in the adult.

Chaetopterus appendiculatus, sp. n., Grube (7), p. 328.

Praxilla nigrita, sp. n., Ehlers (1), p. 297; (2), p. 63, pl. iv. figs. 12-17. *P. zonalis*, Verrill, Am. J. Sci. (3) vii. pl. vi. fig. 2; P. Am. Ass. 1873, p. 384, pl. v. fig. 4.

Clymenella torquata, id. Am. J. Sci. (3) vii., pl. vii. fig. 6. *Ancistria acuta*, id. *ibid.*, pl. vi. fig. 3, P. Am. Ass. 1873, p. 386; *A. capillaris*, id. P. Am. Ass. 1873, p. 385.

Areniella, g. n., Verrill, P. Am. Ass. 1873, p. 386. Head acute, conical, mouth beneath. Body slender, terete, of numerous similar segments, not divided into distinct regions. Upper fascicles of all segments containing slender, acute, bent setæ, usually mingled with some of different forms anteriorly. Lower fascicles with shorter, mostly simple, setæ anteriorly, and bidentate uncini farther back. *A. filiformis*, sp. n., id. *ibid.*

Lagis koreni (Mgn., = *Pectinaria neapolitana*, Clap., and *malmgreni*, Grube); Marenzeller (11), and (12), p. 472, pl. vii. fig. 5.

Scione lobata (Mgn.), Ehlers (Heuglin, l. c.), pp. 241-244; *Potamilla* sp., id. l. c. p. 244.

Grymæa brachiata, sp. n., Ehlers (1), p. 297, & (2), p. 74, pl. iv. figs. 24-27; *G. spiralis*, sp. n., Verrill, Am. J. Sci. (3) vii. p. 407, fig. 1, pl. v. fig. 4, & P. Am. Ass. 1873, p. 387; pl. v. fig. 5; *Pista cristata*, id. Am. J. Sci. l. c. pl. v. fig. 3.

On the tubes of *Lanice conchilega* and *Terebella artifex* (S.), Ehlers (2), pp. 66-74, & 96-99, pl. i. figs. 19 & 20. Ehlers, who observed living specimens of *L. conchilega* making their tubes, at last convinced himself that the ramifications on the upper margin of the tube of these species, and of *T. flabellum*, are secreted by the worm, and are not a sponge ("Aulorhipis"). Eisen (5), who describes and figures tubes similar to those of *T. artifex* (S.), from Norway and the Azores, under the name of *T. palmata*, has arrived at the same results.

Polymnia viridis, sp. n., Malm (9), p. 97, pl. i. fig. 7.

Laphanilla, g. n. Corpus subteres, postice sensim attenuatum; lobus cephalicus brevis, truncatus, superne tentaculis longioribus, inferne multo brevioribus, paucis, instructus; tubercula setigera a segmento 4to incipientia in 11 segmentis obvia, tori untinigeri e segmento 5to (2do setigero) incipientes, usque ad segmentum anteanale obvii; scuta ventralia distincta. *L. venusta*, sp. n. Malm (9), p. 98, pl. i. fig. 8.

Filibranchus, g. n. Corpus vermiforme, postice valde attenuatum; branchiarum paria 2, filiformia, utrinque in dorso segmenti 2di et 3tii adnata; fasciculi setarum capillarium a segmento 6to incipientes, in 17 segmentis obvii. Tubus membranaceus limbo parce obductus. *F. roseus*, sp. n. Id. l. c. p. 99, pl. i. fig. 9.

A new genus of *Trichobranchidæ*, with 8 filiform gills, is announced by Marion (13).

Sabellides fulva, sp. n., Ehlers (1), p. 297; (2), p. 64, pl. iv. figs. 18-23. *Melinna adriatica*, sp. n., Marenzeller (12), p. 472, pl. vii. fig. 6.

Euchone rubella, Ehlers (Heuglin, l. c.), pp. 245 & 246; *E. elegans* (Verr.), Verrill, Am. J. Sci. (3) vii. pl. vii. fig. 4; *Vermilia serrula* (Stimps.), id. l. c. p. 499, fig. 3, pl. vi. fig. 1, P. Am. Ass. l. c. pl. iv. fig. 3. *Sabella fusco-teniata*, sp. n., Grube (7), pp. 328 & 329; *S. discifera*, id. (8), p. 54 (Adriatic); *Protula media* (St.), Möbins, l. c. p. 256, pl. i. figs. 21-24.

On the characters of *Apomatus*, and its relations to *Psymbranchus*; Marion (13).

Phreocystes heydeni, sp. n., Noll (14), (Rhine).

Profiting by Boeck's discovery of the invariable position of certain tubercles on the girdle, called by Eisen "tubercula pubertatis," in relation to the "lobus cephalicus" and "tubercula ventralia," Eisen (3) reviews the Scandinavian species of *Lumbricus*, which he is, through this character, now capable of distinguishing more sharply. The genus *Lumbricus* is subdivided as follows:—

A. *Setæ ubique binæ approximatae*.

I. Tubercula ventralia in segmento 14to post segmentum buccale.

1. Lobus cephalicus postice segmentum buccale in 2 partes dividens. *Lumbricus* (s. str.) *terrestris*, *purpureus*, E., *rubellus*, H.

2. Lobus cephalicus postice segmentum buccale non dividens. *Allobophora*, g. n. (*communis*, *riparius*, *fætidus*, and several new species).

II. Tubercula ventralia in segmento 12do post segmentum buccale.

Corpus postice quadrangulum. *Allurus*, g. n. (*tetrædrus*, Sav.).

B. *Setæ æquo intervallo distantes*, duabus summis exceptis, quarum intervallum aliquanto majus est. Tubercula ventralia in segmento 14to. Lobus cephalicus 3 partes segmenti buccalis occupans. *Dendrobæna*, g. n. (*puter*).

New species:—*Allobophora turgida*, E. (*cyaneus*, Sav.?, &c.), *mucosa*, E. (*carneus*, Sav.?), *norvegica*, E. (Tromsø), *arborea*, E. (in rotten stumps), *subrubicunda*, E., p. 46-53; *Dendrobæna bæcki*, E. (*puter*, E.), p. 53. In a second paper (4) are described: *Allobophora turgida*, var. *tuberculata*, *A. tenuis*, E. (Niagara, Mt. Lebanon), *tumida* and *parvus*, E. (Mt. Lebanon), pp. 43-46, pl. ii. figs. 1-12.

Tetragonurus, g. n., Eisen (4) [name pre-occupied], differing from *Allurus* by the ventral tubercles being placed on the 11th segment, and by the undivided buccal segment; *T. pupa*, sp. n., id. l. c. p. 47, pl. ii. figs. 13-16 (Niagara).

Pontodrilus, g. n., Perrier (16 & 17). *Lumbricini postclitellini*; founded for *L. littoralis*, Gr., and for another species (*P. marionis*, sp. n., Verr.) living among *Posidonia*-detritus, and the like, on the banks of the Mediterranean. From the disposition of its bristles, it approaches the true *Lumbrici*, but its other external characters, and the plan of its organization, are rather those of *Perichæta*, while the want of a true crop or stomach, of a subnervial vessel, and of segmentary organs in the segments of the genital glands, are suggestive of the *Naidea*, and the segmentary organs of *Phreocystes*.

III. DISCOPHORA.

VERRILL, A. E. Synopsis of the North American Fresh-water Leeches.

In Baird's Report of the U. S. Comm. of Fisheries for 1872-1873, pp. 666-689.

New species: — *Macrobdella* (*Philobdella*, subg. n.) *floridana*, p. 669 (Florida); *Semiscollex grandis*, p. 672 (Connecticut, Michigan, &c.); *Clepsine occidentalis*, p. 685 (Colorado); *Ichthyobdella milneri*, p. 687 (Michigan). The same author contributes a list of leeches in F. V. Hayden's Report of the U. S. Geological & Geographical Survey of the Territories, 1874, p. 623.

Hirudo lineata (O. F. Müll.), formerly erroneously considered to be a *Clepsine*, is a species of *Nepheleis*, and probably = *N. quadristriata*, Gr.: BUDDLUND, Förk. Sk. Naturf. xi. pp. 424 & 425.

IV. TURBELLARIA.

1. DIECK, G. Beiträge zur Entwickelungsgeschichte der Nemertinen. Jen. Z. Nat. viii. p. 500-521, pl. xviii. & xix.
2. GRAFF, L. Zur Kenntniss der Turbellarien. Z. wiss. Zool. xxiv. pp. 123-160, pls. xiv.-xix.
3. HALLEZ, P. Sur les glandes accessoires mâles de quelques animaux et sur le rôle physiologique de leurs produits. CR. lxxix. pp. 47 & 48 (abstract in R. Z., 3, ii. p. li.)
4. HUBRECHT, A. A. W. Aanteekeningen over de Anatomie, histologie en ontwikkelingsgeschiedenis van eenige Nemertinen. Utrecht: 1874, (Diss. inaug.) 58 pp. 3 pls.
5. MACINTOSH, W. C. A monograph of the British Annelids. Pt. I. The Nemerteans (1873), pp. 1-96, pls. i.-x. [The portion issued in 1874 has not yet been seen by the Recorder.]
6. WILLEMOES-SUHM, R. VON. On a land-Nemertean found in the Bermudas. Ann. N. H. (4) xiii. pp. 409-411, pl. xvii.

The first portion of MACINTOSH's monograph of the British Nemerteans contains some introductory chapters (habits, food, &c.), a review of the scientific history of the group, and the anatomy of the *Anopla*, after the author's own researches, though with frequent critical references to his predecessors. 9 plates give splendid illustrations of the 27 species among the 31 recognized as British. A more detailed account of the work is unavoidably deferred. Of the species figured, the following are new: — *Tetrastemma robertianæ*, pl. iii. fig. 1; *Lineus lacteus* (Mont., MS.), pl. v. fig. 3; *Micruva fusca*, pl. vi. figs. 3 & 4; *Borlasia elizabethæ*, pl. vii. fig. 1; *Amphiporus hastatus*, pl. viii. fig. 2; *A. bioculatus*, ibid. fig. 3.

HUBRECHT (4) describes the anatomy and histology of the dermo-muscular layer, of the trunk (proboscis) and its including sac, of the digestive tube, the vascular and nervous systems, and the reproductive

organs of Nemerteans, based upon the examination of 13 species, with few exceptions observed at Naples. 3 species are new, belonging to *Drepanophorus* g. n. (*rubrostriatus*, *serraticollis*, and *nisidensis*, spp. nn.), distinguished by the possession, instead of the stylet, of a sickle-shaped hook; eyes about 60, in four series, body depressed, &c. *Cerebratulus spectabilis*, Quatref., of which the aberrant armature has been the cause of some doubt, probably belongs to this genus.

Mesostomum bifidum, sp. n.; MacIntosh, Ann. N. H. (4) xiv. p. 151 (St. Andrews).

Tetrastemma vittata [-tum], sp. n., Verrill, Am. J. Sci. (3) vii. p. 45, pl. vii. fig. 3; P. Am. Ass. 1873, p. 389, pl. ii. figs. 7 & 8 (Casco Bay). *T. agricola*, Willemoës-Suhm (6), pl. xvii. figs. 1-3. Bermuda: anatomy sketched; there is a difference of shape of the stylet according to sex. The young of a *Tetrastemma* were found parasitical on *Nautilograpsus minutus* (l. c. p. 411, pl. xvii. fig. 4).

Macronemertes gigantea, sp. n., Verrill, Am. J. Sci. (3) vii. pl. vii. fig. 2; P. Am. Ass. l. c. p. 389, pl. ii. figs. 5 & 6. *Ophionemertes* (g. n.) *agilis*, sp. n., id. Am. J. Sci. l. c. p. 45, pl. vii. fig. 1; P. Am. Ass. l. c. p. 389, pl. ii. fig. 4. Allied to *Tetrastemma*; eyes numerous, forming a long crowded lateral row or group along each side of the head, converging anteriorly, becoming broad and double posteriorly.

GRAFF (2) has studied the anatomy of the following Rhabdocœlian species:—*Turbella klostermanni*, sp. n., p. 143, pl. xiv. figs. 1-4, and *Monocelis protractilis*, sp. n., p. 145, pl. xiv. figs. 5-9 (Messina); *Mesostomum ehrenbergi*, O.S., p. 146, pls. xv. & xvi.; *Convoluta armata*, sp. n., p. 149, pl. xvii. figs. 1-5, and *cinerea*, p. 151, pl. xvii. figs. 6 & 7, and *Vorticeros pulchellum*, O.S., p. 151, pl. xviii. (Messina); *Prostomum nemertinum* sp. n., p. 153, pl. xix. [The general portion of this paper was published as a dissertation, without figures, in 1873; cf. Zool. Rec. x. pp. 480 & 481].

Nemertes maculosa and *teres*, spp. nn., Ehlers (in Heuglin's "Reisen," l. c.) pp. 248 & 249; *Borlasia incompta*, sp. n., id. l. c. p. 249 (Spitsbergen).

Turbellaria from the great depths of the Lake of Geneva: *Planaria lacustris*, sp. n., *Mesostomum auditivum*, sp. n. (with otocysts!), and *Vortex lemani*, sp. n., Du Plessis, Bull. Soc. Vaud. xiii. pp. 48, 49, 114-124, pl. iii. figs. 1-3.

DIECK (1) has studied the anatomy and evolution of *Cephalothrix* (?) *galathea* (sp. n. ?), which lives on *Galathea strigosa*, devouring its eggs; afterwards it takes its abode in the branchial cavity, and perhaps sucks the blood of the gills. The eggs and spermatozoa are evacuated through defined ventral orifices provided with a sort of lid, and the spermatozoa penetrate through these openings to the eggs, which are thus fecundated and partially furrowed while still in the body of the mother. The author compares the method of evolution of this species with that observed in other Nemerteans, and regards the rejection of the first formed vibratile epithelium, in the embryo, as the last vestige of the "*Pilidium*" metagenesis (or rather metamorphosis) in other species.

A note on the occurrence of *Planaria terrestris* in the neighbourhood of Bath, by L. BLOMEFIELD, P. Bath Club. iii. 1. Also a note on *Geodesmus bilineatus*, by GRUBE, JB. schles. Ges. 1873, p. 56.

V. TREMATODA.

1. GIARD, A. Sur l'encystement du *Bucephalus haimeanus*. C. R. lxxix. pp. 485-487; Ann. N. H. (4) xiv. pp. 375-377.
2. MCCRADY, J. Observations on the food and the reproductive organs of *Ostrea virginiana*, with some account of *Bucephalus cuculus*, sp. n. P. Bost. Soc. xvi. pp. 170-92.
3. ZELLER, J. Ueber *Leucochloridium paradoxum*, Cærus, und die weitere Entwicklung seiner Distomen-Brut. Z. wiss. Zool. xxvi. pp. 564-578, pl. xlviii.; abstract in Arch. sci. nat. li. pp. 366-370.

Short abstracts of 3 papers by ZELLER, W.-SUHM, and LINSTOW, on *Trematoda* [Zool. Rec. ix. p. 428] are given in J. Zool. ii. pp. 51-55. Also a fuller abstract of VAN BENEDEN's paper on the Helminths of the Bats [*op. cit.* x. p. 482], l. c. pp. 113-116, & 308-335.

GIARD (1) has discovered *Bucephalus haimeanus* encysted in the liver, genital glands, and peritoneum of *Belone vulgaris*. MCCRADY (2) roughly sketches a new species from the Virginian oyster. The researches and ingenious experiments of ZELLER (3) have shown, that the small flukes found, encysted in their own epidermis, in a rather advanced state of development, and engendered in the sporocysts of *Leucochloridium* (which have in colour, appearance, and movements such a striking likeness to certain dipterous larvæ), are the larvæ of *Distomum macrostomum*, Rud., which lives in its mature state in the intestines of robins, nightingales, wagtails, and other *Sylviidæ*. These birds greedily devour the mature worm-like sporocysts when protruded from the dilated tentacles of *Succineæ*. *D. holostomum*, Rud., from the water-hens (*Rallus*, *Gallinula*), which devour the *Succineæ* themselves, is evidently the same species, only larger, in accordance with its different habitat. The identity of anatomical structure in the larval and adult *D. holostomum* is proved and illustrated.

VI. CESTOIDA.

1. KRABBE, H. *Diplocotyle Olrikii*, en uledet Bændelorm af Bothriocephalernes Gruppe. Vid. Medd. 1874, pp. 22-25, pl. iii.; abst., J. Zool. iii. pp. 392-395.

Unsegmented (segments fused together); two terminal suckers; genital pores in the middle line of the ventral surface. Found in the intestine of *Salmo carpio*, Greenland, sexually mature. Remarks are appended on the different degree of individualization (independence of segments), duplicity of sexual organs, &c., in the *Bothriocephalidæ*.

2. MAI, S. Sulla tenia. Lettera al Antonio Rota. Milano: 1874, 16 pp.

[Not seen by the Recorder.]

3. MAMBRINI, D. Dei cisticerchi e del cisticerco celluloso negli animali suini in particolare; studi e osservazioni. Mantova: 1874, 30 pp.

[Not seen by the Recorder.]

4. SALENSKY, W. Ueber den Bau und die Entwicklungsgeschichte der *Amphilina*, Wagn. (*Monostomum foliaceum*, Rud.). Z. wiss. Zool. xxiv. pp. 291-342, pls. xxviii.-xxxii.

The anatomical investigation of this parasite of the body-cavity of sturgeons, which has no mouth or intestinal tube, leads to its being placed among the solitary Cestoids, near *Caryophyllæus*.

5. SCHIEFFERDECKER, P. Beiträge zur Kenntniss des feinern Baues der Tænen. Jen. Z. Nat. viii. pp. 458-487, pl. xvi.-xviii.
6. SOMMER, F. Ueber der Bau und die Entwicklung der Geschlechtsorgane von *Tænia mediocannellata* (Küch.) und *Tænia solium* (L.). Z. wiss. Zool. xxiv. pp. 499-563, pls. xliii.-xlvi.

Several portions of the female generative apparatus receive in the course of this elaborate and important investigation a new interpretation; the parts to which the egg owes its constituent element, as "ovary" and "albumigenous gland," the "orgon of Mehlis" as the shell-gland, &c. The successive development and consecutive evanescence of the different portions of both sexual systems is pursued in detail throughout the whole chain; observations on the valvulation of the aquiferous vessels, and the so-termed plasmatic (blood ?) vessels being appended.

C. J. CULLINGWORTH. Notes on a remarkable specimen of tapeworm (in man). Veterinarian, xlvii. pp. 129 & 130; Medical Times and Gazette, 1873, ii. p. 660. (A longitudinal ridge along the middle line of the segments, in the centre of which the genital pores open; laterally only in 4 of 304 segments.)

DAVAINE's article, "Cestodes," in the "Dictionnaire encyclopédique des Sciences Médicales," and a note by J. M'BAIN on an Entozoon, of the genus *Bothriocephalus*, found in the intestine of *Cottus scorpius*, read before R. Phys. Soc. Edinb. March 25th, 1874, have not been seen by the Recorder. H. KRABBE's paper on Tapeworms of Birds is reprinted in abstract, J. Zool. iii. pp. 388-392. A case of *Cysticercus* in the retina of man, observed by CARREROS Y ARAGOS, is recorded in Rec. Méd. Vétér. (6) i. pp. 397 & 398, and a case of cerebral infection of pigs by *Cysticercus cellulosæ*, observed by FOUCHER, in Bull. Soc. Vétér. (3) viii. pp. 141-149. MEGNIN's paper [Zool. Rec. ix. p. 431], is recorded in the "Veterinarian," xlvii. pp. 617-623, with a note by COBBOLD (pp. 640-642) to the effect that the tapeworm described by Megnin is identical with *T. perfoliata* [Zool. Rec. l. c. p. 432]. ST. CYR's experiments [Zool. Rec. x. p. 487] are recorded, *tom. cit.* pp. 368-372. COBBOLD's "Revised List of Entozoa, with notes and references," l. c. pp. 296-300, 472-475, 643-645, 887-890, enumerates the Cestoids of man and domesticated animals; among the former, *Tænia tenella* and *lophosoma*, and *Bothriocephalus cristatus*, Dav. (pp. 888-890).

VII. NEMATODA.

1. BÜTSCHLI, O. Beiträge zur Kenntniss der freilebenden Nematoden. N. Act. L.-C. Ac., xxxvi. [1873] 144 pp. pls. i.-xi. (xvii.-xxviii.).

2. (BÜTSCHLI, O.). Zur Kenntniss der freilebenden Nematoden, insbesondere des Kieler Hafens. Abh. senck. Ges. ix: 56 pp. 9 pl. (1874).

An address delivered by this author before the Senckenberg Naturalists Society in Frankfort, Ber. senck. Ges. 1871-1872, pp. 57-73, on the systematic relations between the free and parasitic *Nematoda*, may here be cited, in addition to previous year's records.

3. COBBOLD, T. S. Notes on Entozoa, II. P. Z. S. 1874, pp. 124-128, pl. xviii.

4. ERCOLANI, G. B. Sulla dimorfobiosi o diverso modo di vivere e riprodursi sotto duplice forma di una stessa specie di animali, osservazioni fatte sopra alcuni Nematelminti. Mem. Acc. Bologn. (3) iv. pp. 237-264, pls. i. & ii.; Abstr., Rend. Acc. Bologn. 1873, pp. 25-29, J. Zool. iii. pp. 67-96.

5. LEWIS, C. On a *Hæmatozoon* in human blood, its relations to chyluria and other diseases. Calcutta: 1874 (2nd edit.).

— The pathological significance of nematode hæmatozoa. Calcutta: 1874.

[Not seen by the Recorder.]

6. LINSTOW, O. v. Ueber *Ichthyonema sanguineum* (*Filaria sanguinea*, Rud.). Arch. f. Nat. xl. pp. 122-134, pl. iv. figs. 1-9.

7. —. Ueber die Muskulatur, Haut und Seitenfelder von *Filaroides mustelarum*, v. Ben. Tom. cit. pp. 135 & 136, pl. iv. figs. 10-12.

8. —. Beobachtungen an *Trichodes crassicauda*, Bell. (*Trichosoma crassicauda*, auctt.). Tom. cit. pp. 271-286, pl. viii.

9. LÖW, F. *Tylenchus millefolii*, n. sp., eine neue, gallenerzeugende Anguillulide. Verh. z.-b. Wien, xxiv. pp. 17-24, pl. i.b.

10. MENGE, A. Ueber eine im Bernstein eingeschlossene *Mermis*. Schr. Ges. Danz. (2) iii. p. 5 (*M. quadristriata*, M.).

11. VILLOT, A. Monographie des Dragonneaux (genre *Gordius*, Dujardin). Arch. Z. expér. iii. pl. 39-72, & 181-328, pls. i. & ii.

In the bibliographical portion, two preliminary papers on the same subject are cited from the "Bulletin de la Société de Statistique de l'Isère," for 1873: "Nouvelles espèces de Dragonneaux du Muséum d'histoire naturelle de Paris," and "Sur l'organisation des Dragonneaux."

12. WILLEMOËS-SÜHM, R. v. Ueber Beziehungen der *Filaria medinensis* zur *Ichthyonema globiceps*. Z. wiss. Zool. xxiv. pp. 161-163.

In J. Zool. ii. pp. 49-51, a summary is given of a paper by COSSE, "Sur l'Helminthe rencontré par Wucherer et Creveux dans les urines hémato-chyleuses" (Rev. Montp. i. p. 190). An observation by LEGROS on Nematoids in the blood of dogs, is shortly recorded in Rec. Méd. Vétér. (3) i. p. 947.

VILLOT's monograph (11) has thrown a new light upon the anatomy and natural history of the *Gordiacei*; this tribe is—excluding the genus *Mermis*, which is referred to the *Nematoda*, pr.—limited to the genus *Gordius* (with *Chordodes*), and a position claimed for it as an inde-

pendent division of the *Vermes*, related to the *Nematoda*, *Gephyrei*, and *Acanthocephala*. 34 species are enumerated: 9 from Europe, 2 from Asia, 5 from Africa, 12 from America, and 5 from Oceania; the following described as new:—*G. æneus* p. 52, pl. ii. fig. 12 (Cumana); *levis*, p. 52 (New Caledonia); *incertus* (Tasmania) and *gracilis* (Teneriffe), p. 53; *deshayesi* (Caraccas), p. 53, pl. i. fig. 3; *subareolatus* (Isère, Hautes Pyrénées), p. 54, pl. ii. fig. 10; *chinensis* (China), p. 56, pl. ii. fig. 7; *blanchardi*, p. 56, pl. i. fig. 1 (Mauritius); *abbreviatus* (I. Bourbon), p. 57, pl. i. fig. 4; *reticulatus* (California), p. 57, pl. i. fig. 5; *prismaticus* (Bogotá), p. 58, pl. i. fig. 2; *trilobus* (Jersey), p. 59, pl. ii. fig. 9; *caledoniensis* (New Caledonia), p. 62, pl. ii. fig. 8; *tuberculatus* (Rockhampton), p. 63. The figures cited, and those of *G. tolosanus*, pls. i. fig. 6, ii. fig. 11, give only the areolation, &c., of the skin, which plays a prominent part in the determination of the species. [The idea of the author, that species are only *subjective* conceptions, of which the "caractéristique" given is the essential thing, would, of course, induce as its consequence, endless changings of names, and confusion in nomenclature.] A full account of the anatomy of the adult worm (in which the mouth is wanting, and the intestinal channel rudimentary) is given; under the tegument (consisting of a structureless cuticle and a fibrous skin) lies a continuous layer of longitudinal muscles, only divided along the mesial ventral line by a vertical band of nervous filaments, which establishes the communication between the peripheral nervous layer, interposed between the integument and the muscular layer, and the ventral nervous string which is placed between the intestine and the muscular layer, and provided at each end of the body with a ganglion-like expansion. At the anterior extremity the peripheral layer is strongly developed, and forms, reposing immediately on the ganglion-like termination of the ventral chord, a sort of nervous hood, possibly adapted for visual purposes; the sensorial papillæ of the skin throughout receive filaments from the multipolar nervous cells of the peripheral layer. In the cloaca, terminate the intestine and the two large reservoirs for the eggs and sperma, which are placed on each side of the obliterated alimentary channel. The eggs are deposited in strings in the water; their evolution is described in all its principal phases (the embryonal cells are the progeniture of the germinative vesicle, the true cell of the egg). The embryo has a wrinkled skin, a head, mouth, proboscis, cesophagus, and intestine, and a secretory apparatus, consisting of some gland-cells and a duct opening close to the base of the three stylets of the proboscis; the head is further armed with three circles of spines, forming a rather complicated piercing apparatus; the body-cavity is filled up with embryonal cells, from which the muscles, nervous system, and, at a much later period, the sexual products, are developed in succession. By means of the stylets, &c., the larvæ penetrate the aquatic larvæ of *Diptera* (*Chironomus*), in which they encyst, though preserving a certain freedom; when the dipterous larvæ are devoured by fishes (*Phoxini*, *Cobitis*), they are set free again for a short time, but soon establish themselves in the walls of the intestine, where they may be found quiescent and encysted in autumn in great numbers; the dif-

ferent species may be recognized by peculiarities of position in the cysts, armature of the head, &c. In the spring, 5-6 months after the encystation, the young *Gordii* leave the cysts, and are carried outward with the faeces into the water; in contact with this, the body is considerably dilated and lengthened, the armature and wrinkles disappear. The first period is passed in the mud, in immobility; it is only when the worm has acquired a length of 4-5 centim. that it acquires its perfect shape. The *Gordii* of many different species, so often found in terrestrial or aquatic insects, or observed in the act of extricating themselves, are only aberrant individuals? [cf. Zool. Rec. ix. p. 435], which have succeeded in fulfilling their growth and development under very unnatural circumstances.

A synopsis of the characters of the genera of free-living *Nematoda* examined by BÜTSCHLI in his two monographs (1 & 2) is given (2), pp. 55 & 56 (*Sphaerolæmus* and *Oxytoma* are however omitted). The anatomical characters are fully considered in these papers; in some instances, also parts of the evolution. The points of controversy between BÜTSCHLI and MARION are discussed in the introductory chapters of the 2nd paper. The genera and species described and figured in both papers are enumerated below; of the species marked with an asterisk (*), figures are given. There is no well defined limit between parasitic and non-parasitic *Nematoda*, and none of the proposed systems can be entirely approved.

Plectus, Bast. (1), p. 83; *parietinus*, B.,* p. 89; *armatus*,* sp. n., p. 90; *auriculatus*,* sp. n., *communis*, sp. n., p. 91; *longicaudatus*,* sp. n.; *granulosus*, B.,* p. 92; *assimilis*,* sp. n., ? *ornatus*,* sp. n.: ? sp.,* p. 34.

Cephalotus, Bast. (1), p. 77; *persegnis*, B.,* p. 80; *striatus*,* B., *oxyuris*,* B., p. 81; *longicaudatus*,* sp. n., p. 82.

Anguillula, Ehrbg. (1), p. 68; *terrestris*,* sp. n., *aquatica*,* sp. n., p. 69. Observations on *A. devastatrix*, (?) in galls close above the root of wheat, by Nowicki, Verh. z.-b. Wien, xxiv. p. 358.

Rhabditis, Duj. (1), p. 95; *brevispina*,* Cl., p. 104; *oxyuris*,* Cl., *filiformis*,* sp. n., *monhystera*,* sp. n., p. 106; *teres* * (Schn.) (*Pelodera*), p. 107; *pellioides*,* sp. n., p. 111; *pellio** (Schn.) (*Pelodera*), p. 112; *aspera*,* sp. n., p. 113; *longicaudata*,* sp. n., p. 114; *dolichusa* * (Schn.) (*Leptodera*), p. 115; *schneideri*,* p. 116; *clausi*,* sp. n., p. 118.

Tylenchus, Bast. (1), p. 31; *filiformis*,* sp. n., *davainii*, B.,* p. 37; *velatus*,* sp. n., p. 38; *dubius*,* sp. n., *askenasii*,* sp. n., p. 39; *fungorum*,* sp. n., p. 41; ? *mirabilis*,* sp. n., p. 44. *T. millefolii*, sp. n., Löw (9), in galls on the petioles of *Achillea millefolium*; the young worms hibernate in the mouldering galls, but creep, in spring, along the young shoots and penetrate into the delicate tissue of the young leaves.

Aphelenchus, Bast. (1), p. 45; *avenæ*,* B., p. 46; *parietinus*,* B. ?, p. 47; *rivalis*,* sp. n., p. 48; *fetidus*,* sp. n. (2) p. 20.

Diplogaster, M. Sch. (1), p. 119, (2) p. 22; *rivalis* (Leyd.) (1), p. 120 (*factor*, B.); *inermis*,* sp. n., *filicaudatus*,* sp. n. (2) p. 22; *monhysteroideis*, sp. n., p. 23.

Dorylæmus, Duj. (1), p. 19, (2) p. 19; *stagnalis*,* D., *papillatus*, B.,* p. 27; *leuckarti*,* sp. n., p. 28; *bastiani*,* sp. n., p. 29; ? *minutus*,* sp. n., p. 30; *maximus*,* sp. n. (2), p. 19; *longicaudatus*, sp. n., p. 20.

Spilophora, Bast. (2), p. 44; *inequalis*, B. ?, p. 44; *setosa*,* sp. n., *costata*, B.,* p. 45; *robusta*, B.,* *communis*,* sp. n., p. 46; *oxycephala*,* sp. n., p. 47.

Chromadora, Bast. (1), p. 70, (2) p. 47; *bioculata*, M.S.* (1), p. 70; ? *dubia*,* sp. n., p. 72; *germanica*,* sp. n. (2) p. 48.

Odontophora, g. n. (2) p. 49. Body tapering towards both extremities, especially backwards; mouth-cavity large, funnel-shaped; round its orifice, are placed three large, pointed, strongly chitinated teeth, capable of meeting inwards; bristles on head and body; oesophagus with a posterior bulb; female sexual organs symmetrical, paired. *O. marina*,* p. 49.

Cyatholæmus, Bast. (2), p. 48; *dubiosus*,* sp. n., p. 48, *proximus*,* sp. n., p. 49.

Monhystera, Bast. (1), p. 58, (2) p. 24 (= *Tachypodites* and *Theristus*, B.); *M. stagnalis*,* B., p. 61; *similis*,* sp. n., p. 62; *crassa*,* sp. n., *filiformis*,* B., p. 63; *rustica*,* sp. n., *villosa*,* sp. n., p. 64; *dubia*,* sp. n., p. 65; ? *intermedia*,* sp. n., p. 67; *elongata*,* sp. n. *velox* (B.),* p. 26; *ambiguoides*,* sp. n. ?, p. 27; *socialis*,* sp. n., p. 28; *ocellata*,* sp. n., *setosa*,* sp. n., p. 29.

Comesoma, Bast. (2), p. 30, *profundi*, B.,* p. 31.

Linhomœus, Bast. (2), p. 31; *hirsutus*,* B., p. 31; *tenuicaudatus*,* sp. n., p. 32; *mirabilis*,* sp. n., p. 33.

Trilobus, Bast. (1), p. 53, *gracilis*,* B. p. 53.

Tripyla, Bast. ? (1), p. 48, (2) p. 33; *setifera*,* sp. n. (1), p. 51; *intermedia*,* sp. n., *papillata*,* sp. n., p. 52; *marina*,* sp. n. (2), p. 33.

Oxystoma||, g. n. Anterior and caudal extremity much tapering, especially the latter; mouth-cavity almost wanting; oral bristles rudimentary, those of the body almost wanting; cuticle not annulate, of moderate thickness; oesophagus swelling gently posteriorly; ventral gland double, reaching almost to the posterior extremity of the oesophagus; caudal gland with simple orifice; lateral lines well developed, with many large granular cells; testis single; spicules of moderate size and equal curvature; accessory part small, feebly developed; male papilla wanting. *O. elongata*,* sp. n., p. 34.

Anticoma, Bast. (2), p. 35, *limalis*, B.,* p. 35.

Thoracostoma, Marion (*Leptosomatum*, Bast., pt.; *Hemipsilus*, Leuck.) (2), p. 41; *globicaudata*, Schn.* (*L. figuratum*, B. ?), *schneideri*,* sp. n., p. 42.

Enoplus, Duj. (*Enoplostoma*, Mar.) (2), p. 40, *communis*, B.,* p. 40, *labiatus*, sp. n., p. 41.

Anoplostoma, g. n. (*Symplocostoma*, Bast., pt.) (2) p. 36. Body tapering towards both extremities, especially backwards; cuticle not annulate; a circle of six large strong (and several smaller) setæ at a short distance behind the extremity of the head; sometimes also small bristles on the body in the sub-median lines; mouth-cavity very large and deep, with the walls strongly chitinated; oesophagus swelling gently posteriorly; nervous ring a little before the middle of the oesophagus; orifice of the caudal gland simple, at the point of the tail; female sexual organs paired; spicules slender, curvate; accessory portion triangular when viewed laterally, of moderate size. Behind the vent in the male, a row of papillæ and bristle-like papillæ. *A. vivipara*,* B., *spinoza*,* sp. n., p. 37.

Mononchus, Bast. (1), p. 73, *truncatus*,* B., p. 75; *papillatus*,* B., p. 76; *brachyuris*,* sp. n., p. 77.

Oncholæmus, Duj. (2), p. 37; *vulgaris*,* B., p. 38; *viscosus*,* B.; *fuscus*, B.; *albidus*,* B., p. 39.

Spherolæmus hirsutus,* Bast. (2), p. 43.

Abstracts of A. J. MARION's papers on the non-parasitic marine Nematoids, and of that of É. PERRIER on *Hedruris*, are to be found in J. Zool. i. pp. 171-175, and pp. 201-203.

Ascaris turgida, Cobbold (3), p. 125, pl. xviii. fig. 6 (*Cercopithecus*, stomach); *A. maculosa* (Rud.), *id. l. c.* p. 126, pl. xviii. figs. 7-20 (in pigeons; with notes on the epidemic disease caused by their rapid development in enormous numbers).

Spiroptera turgida, Cobbold (3), p. 125, pl. xviii. fig. 5 (*Didelphis azarae*, stomach). *S. sp.* (in poultry), Ann. Soc. Mod. vii.; Veterinarian, xlvii. p. 374.

Filaria gracilis, Rud.; Cobbold, *l. c.* p. 124, pl. xviii. figs. 1-4 (*Ateles*, omentum).

Filaria sanguinea, Rud., (body cavity of *Cyprinoids*) is an *Ichthyonema* (of which a new generic characteristic is given); LINSTOW (6). Male very minute; as the female has no vulva, copulation probably takes place by piercing the skin of the female with the spicula; the mature females probably perforate the intestinal wall of the fish, and pass with the excrement into the water, where they burst and set free their embryos. *Aselli* are perhaps their temporary hosts. W.-SUHM (12) points out the analogies between *Ichthyonema* and *Filaria medinensis*. A note by BOETTCHER on *Filaria medinensis*, SB. Ges. Dorp. iii. (1872) pp. 275-277, records the observation of embryos in enormous numbers in the inflamed tissue in the immediate vicinity of the worm, a fact which explains the dangerous cases sometimes occurring.

Filarioides belongs to the *Polymyaria*, Schn.; LINSTOW (7).

A note by LEIDY on *Filaria (Habronema) muscæ* ("On a parasitic worm of the house-fly"); P. Ac. Philad. 1874, pp. 139 & 140.

Sclerostoma auratum in ducks; Hayem, Rec. Méd. Vétér. (3) pp. 946 & 947.

Trichosoma crassicauda, Bellgh., is made the type of a new genus, *Trichodes*||, by LINSTOW (8), distinguished by the want of bursa and spicule in the male, which is very minute and makes its way through the vulva into the oviduct of the female, during the passage of those organs from the ureters, at a time when the female is still relatively small; afterwards she increases in size, and several males take their abode in her interior. A large male Nematoid, found with *Trichodes crassicauda* in the bladder of the Norway Rat, is described as *Trichosoma schmidtii*, sp. n.

Trichonema arcuata[-tum], g. & sp. nn., Cobbold, "Veterinarian," xlvii. p. 85 (intestine of horse, in the walls or in faecal pellets). "Observations on rare parasites from the horse," *id. l. c.* pp. 81-87; "Further remarks on rare parasites from the horse," *id. l. c.* pp. 217-219. On epidemics and diseases in horses derived from Nematoid and other parasites: Cobbold, "Fatal epidemics affecting ponies," *l. c.* pp. 403-412 [*Strongylus tetracanthus* and *Tenia perfoliata*], and "Report on para-

sites from India," *l. c.* pp. 788-790; * R. S. Hart, "Observations on parasites from the horse and from other animals," *l. c.* pp. 786-788, and "The Nematoid parasites found between the coats of the stomach of the horse," *l. c.* pp. 666-670.

The *Entozoa* found in various arctic mammals and birds at Spitzbergen and Nova Zembla are enumerated by Heuglin (Reisen, iii. pp. 254-256); in many instances however the specific name is left undecided.

A note on the occurrence in Ireland of *Dasydytes antenniger* and *Chaetonus gracilis*, Gosse, Q. J. Micr. Sci. xiv. p. 106, may perhaps be most conveniently cited here, the systematic position of these animals being still undetermined.

VIII. ACANTHOCEPHALA.

Echinorhynchus moniliformis, from *Sciurus vulpinus*, briefly described by H. C. CHAPMAN; P. Ac. Philad. 1874, p. 76. A paper (in Russian) read by SALENSKY at the meeting of the Russian Association of Naturalists at Kiew, 1873, on the structure of *E. angustatus*, has not been seen by the Recorder. An abstract of LINSTOW's paper [Zool. Rec. ix. p. 435], Z. ges. Nat. xliii. pp. 470 & 471.

IX. GEPHYREA.

TEUSCHER, R. Notiz über *Sipunculus* und *Phascolosoma*. Jen. Z. Nat. viii. pp. 488 & 489, pl. xix.

Histological observations on *Sipunculus nudus* and *Phascolosoma granulosum*, *elongatum*, and *capense*, sp. n., of which a short description is given. [On *Echiurida*, cf. *suprà* p. 494.]

Phascolosoma ærstedii, Kef., Ehlers, in Heuglin's Reisen, iii. p. 246; *P. boreale*, Kef.?, Verrill, P. Am. Ass. 1873, p. 387; *cœmentarium*, Verrill, *ibid.*; *tubicola*, Verrill, *l. c.* p. 388. *Chaetoderma nitidulum*, Lov., *id. l. c.* pl. vi. fig. 6. *Halicryptus spinulosus*, Sieb., Ehlers, *l. c.* pp. 247 & 248.

* As relating to Helminthology generally, two papers by J. S. COBBOLD may be here additionally cited:—"Remarks on the classification of animal parasites" (*l. c.* pp. 7-9), "Parasites, and the part they play in the economy of nature" (pp. 168-179). Cobbold's "Manual" is translated by T. Tommassi, "Parasiti interni degli Animali Domestici, Manuale degli Entozoi del bove, della pecora, del cane, del cavallo, del majale, e del gatto." Also a dissertation by MULLER, "Statistik der menschlichen Entozoen" (Erlangen: 1874). As the statistics and occurrence of the *Entozoa* of man and of the domestic animals, the sufferings or diseases produced through them, &c., cannot be regarded as foreign to their natural history in a broader sense of the word, it is almost impossible to draw a definite line between those helminthological papers, which fall entirely within the limits of zoology, and those which more properly belong to medical science. The Recorder has been obliged to give up the idea of enumerating all the helmintho-pathological papers dispersed in various medical journals, but may specially indicate the following:—H. MEISNER, "Beiträge zur Helminthologie und Parasitenlehre," A. Blasenwürmer (in Schmidt's "Jahrbücher der in- und ausländischen gesammten Medicin, olxiv. 1874, pp. 188-207), and BOLLINGER & PONSFICK, "Animal Parasites in Animals and Men" (in Virchow and Hirsch's Jahresbericht über die Leistungen und Fortschritte in der gesammten Medicin, viii. 1873, pp. 606-611, 638-642, and ix. 1874, pp. 352-364, 714-719).

ECHINODERMATA.

BY

C. F. LÜTKEN, PH.D., F.R.D.A.

1. AGASSIZ, A. Revision of the *Echini*. IV. Structure and embryology of the *Echini*. Cat. Mus. C. Z. vii. pp. 630-762 (reviewed, Arch. sci. nat. l. pp. 402-411).
2. — & L. F. POURTALES. Zoological results of the "Hassler" expedition. I. *Echini*, Crinoids. *Op. cit.* viii.
3. BAILY, W. H. Remarks on the palæozoic *Echinidæ*, *Palæchinus* and *Archæocidaris*. J. R. G. Soc. Irel. iv. pp. 40-43, pls. iii. & iv.; abstr., Z. ges. Nat. (2) xi. pp. 337 & 338.
4. BOLAU, H. Neue Spatangiden des Hamburger Museums. Arch. f. Nat. xl. pp. 175-178, pl. vi.
5. ETHERIDGE, R., JUNR. On the relationship existing between the *Echinothuridæ* and the *Perischoechinidæ*. J. G. Soc. 1874, pp. 307-316, pl. xxiv.; abstr., Geol. Mag. (2) i. p. 235.
6. GAUTHIER, V. Sur les Échinides qui vivent aux environs de Marseille. C. R. lxxix. pp. 401-404; abstr., R. Z. (3) ii. pp. lvi.-lviii.
7. HOFFMANN, C. K. Sur l'anatomie des Astérides. Arch. Neerl. ix. pp. 131-163, pls. i. & ii.
8. —. Recherches sur la Faune de Madagascar et de ses dépendances, d'après les découvertes de F. P. L. Pollen et D. C. van Dam. V. 2. (Échinodermes) pp. 45 & 46, pl. x.
9. LACAIZE-DUTHIERS, H. DE. Sur une forme nouvelle et simple du proembryon des Échinodermes (Stellérides, *Asteriscus verruculatus*, M. Tr.). C. R. lxxviii. pp. 24-30; Arch. Z. expér. iii. pp. 18-23; abstr., R. Z. (3) ii. pp. i.-iii.
10. LYMAN, T. *Ophiuridæ* and *Astrophytidæ*, new and old. Bull. Mus. C. Z. (3) x. pp. 221-272, pls. i.-vii.
11. MARENZELLER, E. VON. Kritik adriatischer Holothuriën. Verh. z.-b. Wien, xxiv. pp. 299-320.
12. PÁVAY, E. Die fossilen Seeigel des Ofnermergels. JB. ungar. geol. Anst. iii. 2, 8 pls. 188 pp. [abstr., Verh. geol. Reichsanst., 1875, pp. 58 & 59].

13. PERRIER, É. Sur l'appareil circulatoire des Oursins. C. R. lxxix. pp. 1128-1132; abstr., R. Z. (3) ii. pp. lxx-lxvi.
14. SCHMIDT, F. Miscellanea silurica. II. Ueber einige neue und wenig bekannte baltisch-silurische Petrefacten. Mém. Pétersb. (7) xxi. No. 11, 48 pp. 4 pls.
15. SEMPER, C. Kurze anatomische Bemerkungen über *Comatula*. Arb. Inst. Würzb. i. pp. 259-263. Translated with an addendum by W. B. CARPENTER, in Ann. N. H. (4) xvi. pp. 202-209.

Embryology, Anatomy, &c.

The larger portion of the concluding part of AGASSIZ'S "Revision" (1) is devoted to the anatomy and embryology of the *Echinida*, the former of which subjects would have been more complete, had not the author's notes and drawings been destroyed in a conflagration. An analysis would be out of place here.

PERRIER has studied the circulatory system of *Echinus* (13), arriving at results, which are in several important points contradictory to those attained by other anatomists. The presumed "heart" is, according to him, only a gland. The vertical vessel ("sand canal"), which abuts on the "madreporic body," opens at the other extremity in the circular vessel of the "lantern," which is the only vascular circle that Perrier was capable of discovering; the five vessels which spring from this circle, are continued in the five ambulacral vessels, which give off branches for the ten great buccal tentacles, but terminate "en cul de sac" behind the "ocular" plates; there is however in this place neither eye or tentacle, as has been supposed, nor any communication with the exterior. There is no anal vascular ring. The internal intestinal vessel springs directly from the vascular ring of the lantern, in a place opposite to the "sand canal;" its branches form the capillaries of the intestine and mesentery, which are again in direct communication with the external intestinal vessel; there are other anastomosing vessels combining the two principal vessels of the intestine, but apparently no direct communication between the external intestinal vessel and the vascular circle, &c.

HOFFMANN confirms (7) in several important points the surprising results arrived at by GREEFF. The five nervous bands, occupying the whole length of the bottom of the ambulacral furrows, outside the ambulacral skeleton, are subdivided each into three longitudinal cavities, which belong to the vascular system; the walls are continued in the suckers (ambulacral feet), the external layer of which is formed of the same fibrillated, ganglionic substance as the bands themselves; the pentagonal central portion of the nervous system, from which the five ambulacral bands spring, covers the double pentagonal oral vascular rings, which also lie on the outside of the buccal membrane; the lymphatic oral ring gives off five ambulacral stems, which lie above the nervous bands, but below the ambulacral skeleton, and communicate with the suckers; the true vascular oral ring gives off three branches for each arm, but these branches are the true cavities of the nervous bands; the anal vascular circle communicates with the oral circle by means of the tube enclosing the "stone canal,"

through which the lymphatic system communicates with the exterior, &c. No direct connection between the vascular and lymphatic systems could be discovered; they contain globulose and amified corpuscles similar to those found in the fluid of the body cavity. The vessels connecting the anal ring with the genitalia appear to be also the excretory ducts of these organs.

LACAZE-DUTHIERS (9) has discovered that the larva or pro-embryo of *Asterina* is not free, swimming, but sedentary. The eggs are deposited on stones; the embryo is globular, with two arms, forming a crescent, by means of which it fixes itself, alters its position, moves about, &c. The arms disappear when the young star-fish is formed, but it is still temporarily fixed by a kind of pedicle, arising from the centre of the actinal disc, &c.

MARION'S note on the hybridization of *Echini* is reprinted, J. Zool. ii. pp. 304-307.

In a note by A. AGASSIZ, "Sur la fertilisation artificielle de deux espèces d'étoiles de mer," Arch. Z. Expér. iii. p. xlvi., it is intimated, that the perplexing intermediary forms of *Asterias*, s. str., often encountered, may be due to accidental natural hybridization; sterile specimens are by no means uncommon, and artificially fecundated hybrid embryos may attain the stage, where the young star begins to form itself on the aquiferous tube of the larva. In a note in the same periodical, pp. vii.-xv., "Sur les pédicellaires et les ambulacres des Astéries et des Oursins, réponse à Mr. A. Agassiz," by É. PERRIER, a paper is cited by Stewart on the calcareous plate in the disc of the suckers of *Echini*, in M. Micr. J. 1873, which has not been seen by the Recorder.

According to SEMPER (15) (and CARPENTER) the string in the arms of *Antedon*, *Pentacrinus*, &c., determined by J. Müller as the nerve-cord, is, in reality, a part of the reproductive system, connecting the ovaries of the "pinnule" to the main body. In opposition to Perrier, it is shown that two parallel vessels or channels really exist in the arms of Crinoids, besides the true tentacular channel and the axial chord of the calcareous segments (Carpenter's nerve-string) which communicates with J. Müller's presumed "heart."

H. LUDWIG [suprà, p. 495] on the formation of the egg in *Echinodermata*, pp. 39-48.

Notes by MACINTOSH on the microscopical structure of the spines of *Centrostephanus rodgersi*, *Strongylocentrus* (*Toxopneustes*) *lividus*, *Colobocentrus atratus*, *Astropyga radiata*, and *Oreaster tuberculatus*; Q. J. Micr. Sc. xiv. pp. 317-321, 422, & 425.

The unpaired sucker of the *Asteridæ* is also present at the extremity of the arms in the *Ophiuridæ*. Greeff, SB. Ges. Marb. 1874, 2, p. 31.

Faunas, Local Lists, &c.

MACINTOSH has contributed a list of the *Echinodermata* of St. Andrews (Ann. N. H., 4, xiv. pp. 68-75), with short notes, especially on *Holothuridæ*; HUTTON (*op. cit.* xiii. p. 95) alludes briefly to the more prominent features of the New Zealand fauna and its relations; the papers of

VERRILL, MÖBIUS, and WHITEAVES, quoted above [p. 493], contain also much information on the distribution of northern *Echinodermata*. In HEUGLIN's "Reisen," iii. pp. 257 & 258, 13 species are enumerated from Spitzbergen, and 5 from Nova Zembla. AGASSIZ (2) enumerates 16 species of *Echini* found at the depth of 100 fathoms off Barbadoes; at Cape das Bahias (dividing the tropical and Patagonian provinces), 2 West Indian species were still associated with 3 Patagonian. GAUTHIER (6) records 14 species of *Echinidæ* from the neighbourhood of Marseilles, the true *Echinocardium cordatum (flavescens)* among the number; after the formation of the Suez Canal, *Heterocentrus mamillatus* has made its appearance in the adjoining parts of the Mediterranean, at Port Said. The 45 *Ophiuridæ* collected at the Philippine and Pelew Islands, by SEMPER, are recorded by LYMAN (10). HOFFMANN (8) has prepared a list of the 85 known *Echinodermata* of Madagascar and the Mascarene Islands, noticing specially the 9 or 10 species brought home by POLLEN and V. DAM. A preliminary account of the occurrence of various prominent genera of *Vermes*, *Echinodermata*, *Anthozoa*, and *Spongozoa*, in the great depths of the Southern Seas, are to be found in WYVILLE THOMSON's letter to Admiral Richards, P. R. Soc. xxiii. pp. 423-428, Ann. N. H. (4) xiv. pp. 331-337, and in W.-SUHM's letters to Prof. v. Siebold, Z. wiss. Zool. xxiii. pp. i.-vii., xxiv. pp. ix.-xxiii., xxv. pp. xxv.-xli.

Genera and Species.

HOLOTHURIIDÆ.

The Sea-Cucumbers of the Adriatic are critically discussed by MARENZELLER (11); *Cucumaria planci*, Brdt., = *C. doliolum*, auctt., not of Pallas, whose species is probably a *Colochirus*; *C. grubii*, M., = *C. diguemari*, auctt.; *C. cucumis*, Risso, = *pentactes*, Sel.; *C. elongata*, K. D., = *C. pentactes*, auctt.; *C. hyndmanni*, Th. (not identical with *C. koreni*, Ltk.); *Holothuria poli*, d. Ch., Sel., = *H. stellati*, Grube, Sars, Heller, *glabra*, Semper; the true *H. stellati*, d. Ch., = *glabra*, Gr., &c.

Oligotrochus vitreus, Sars, Am. J. Sci. (3) vii. pl. viii. fig. 6; P. Am. Ass. 1873, pl. vi. fig. 5. On the "Tripang" of the Pacific: Jouan, Mém. Soc. Cherb. (2), xviii. pp. 231-240.

ECHINIDÆ.

Asthenosoma hystrix, W. T., Agassiz (2), p. 3, pl. ii. figs. 1 & 2 (Barbadoes, 100 fathoms). Agassiz now agrees with W. Thomson, that *Asthenosoma* must make a family for itself, "on account of the mailed structure of the coronal plates lapping in opposite directions in the ambulacra and interambulacra, of the perforated ambulacral plates, and the extension of the ambulacral tubes to the actinal opening, through the buccal membrane, which is mailed, as in *Cidaris*."

Cidaris (Phyllacanthus) verticillata, Lmk., *fustigera*, Ag., *pistillaris*, Lmk.; Hoffmann (8), pp. 44-50.

Astropyga pulvinata, Lmk.; Agassiz (2), p. 5, pl. i. figs. 1 & 2 (Panama). *Arbacia dufresnii* (Blv.), id. l. c. p. 6, pl. i. figs. 3 & 4 (Straits of Magel-1874. [VOL. XI.]

haens). The genera *Pygomma* and *Tetrapygos* [Zool. Rec. ix. p. 444] are not recognized. *A. æquituberculata* (Mediterranean), *pustulosa* (Brazil), and *loculata* (Guinea), are united under one specific name.

Cælopleurus floridanus, id. (2), p. 8, pl. i. figs. 5-7.

Echinus magellanicus, Phil., id. l. c. p. 11, pl. iii. fig. 5; *margaritaceus*, Lam., id. *ibid.*, pl. ii. fig. 6, pl. iii. fig. 4 (Juan Fernandez ? Cape das Bahias).

Echinometra lucunter (L.) [?] and *Colobocentr[ot]us atratus* (L.) ; Hoffmann (8), p. 51.

Monophora darwini, Desor ; Agassiz (2), p. 12, pl. iii. figs. 1-3 (Tertiary).

Some of AGASSIZ'S figures of *Pourtalesia* are copied, Z. Zool. ii. pl. ix., with a report on pts. 1 & 2 of the "Revision" (pp. 216-221).

Palæopneustes cristatus, Agassiz (2), p. 13, pl. iv. figs. 1-3. The representative in our days of *Anachytes*, resembling it in outline and general appearance so far that it may, at first sight, readily pass for *A. gibbosa* [Zool. Rec. x. p. 500].

Nacospatangus gracilis, id. l. c., p. 17, pl. ii. figs. 3-5 [Zool. Rec. l. c.].

Lovenia cordiformis, Ltk., id. l. c. p. 19 (California).

Agassizia excentrica, id. *ibid.* (Barbadoes, 100 fathoms, &c.). The young Spatangoid figured, pl. xiv. figs. 9-12, of the "Revision," is not the young of *Agassizia*, but of another unknown Spatangoid.

Hemiaster philippii (Lov.), id. l. c. p. 20, pl. figs. 4-8 (Patagonia). With increasing age and size, the ambulacra from shallow become deeply sunken, and change their form so much, that the range of the transformation in this one species is far greater than distinctions, used as generic features among allied fossil Spatangoids. *H. australis* is therefore possibly the young form of *H. cavernosus*.

Tripylus excavatus, Phil., ? (Young) id. l. c. p. 52.

Maretia (?) *elliptica*, Bolau (4), p. 175, pl. vi. figs. 1 & 2 (Maldon Island, South Sea).

Brissus sternaloides, id. l. c. p. 177, pl. vi. fig. 3 (Bay of Siam).

Deákia, g. n., Pávay (12), p. 148, "differt a *Brisso* et *Brissopsi*, sulco frontali profundo, tuberculis maximis areolatis, et præcipue rostro postico saliente, a *Plagionoto* vertice excentrico, facie posteriori oblique truncata et rostrata, petalis anticis fere horizontaliter distantibus, tuberculis majoribus per fasciolam peripetalam antice non limitatis ; a *Lovenia*, fasciola interna deficiente." [As to the instability of this genus, cf. Verh. geol. Reichsanst. 1875, p. 59.] For *D. rotundata*, *ovata*, and *cordata*, spp. nn., id. *ibid.*

Special chapters are devoted to "the geological succession of *Echini*," and to the *Perischoechinida*, in AGASSIZ'S "Revision." ETHERIDGE (5) reviews the characters of the palæozoic division, while BAILY (3) corrects those of some of its genera. *Bothriocidaris*, Eichw., of which two species are described and figured by SCHMIDT (14), is the type of another principal division of palæozoic Sea-Urchins, distinguished—in opposition to the "tessellate" division—by the shell being only composed of fifteen series of plates, 5 single series of interambulacral plates alternating with 5 double series of ambulacral plates. Each of these is provided with a pit, which includes 2 pores for the suckers, and has, on the

upper edge of this pit, 2-4 perforate tubercles for small spines; in one species, the ambulacral plates are quite naked; in the other, they have 1-3 spinigerous tubercles. The interambulacra do not reach to the inferior (actinal) orifice, which is surrounded by 10 ambulacral and 5 small oral plates; near the superior (abactinal) orifice, each ambulacrum ends in a single plate with 1-3 tubercles; the orifice itself is partially closed by small elongate plates.

ASTERIDÆ.

HOFFMANN (8), p. 47, has some notes upon *Linckia multiforis*, Lam., and *L. miliaris*, M. Tr. [*L. lævigata*, L.; among its synonyms is *Oph. suturalis*, M. Tr., referred to *Phataria* by the Recorder]. *Oreaster muricatus* (Linck), l. c. p. 48, pl. x. fig. 71, should have been termed *O. lincki*, Blv., as shown by the Recorder in 1864. Among the synonyms, are cited *O. castellum*, Gr. [correctly], *tuberculatus*, M. Tr., and *O. mamillatus*, M. Tr. ? [The last at least should have been omitted.] Var. *mutica*, l. c. p. 49, pl. x. fig. 72.

Of the Recorder's "3rd critical and descriptive Memoir on Starfishes" (1872), an abstract is given in J. Zool. ii. pp. 255-264.

OPHIURIDÆ.

LYMAN'S paper (10) is partly based upon an examination of the principal European collections, and discusses or elucidates many points of doubt or controversy: it concludes with a digression on "the homologies of the chewing apparatus." Several plates and their explanation are devoted to the terminology and general morphology of this order. An analytical table is given (p. 221) of *Pectinura*, Forb. (including *Ophiopozella*, Lgm., and *Ophiachasma*, Grube); notes and figures are given of *P. infernalis*, M. Tr. (pl. vii. fig. 1), and *septemspinosa*, M. Tr. (pl. vi. figs. 10-13). *P. marmorata* (p. 222, pl. v. figs. 1-7, Philippines), and *rigida* (p. 224, Zanzibar), spp. nn. *Ophiochasma adpersum*, Gr., = *P. stellata* (Lym.); *Ophiopoeza yoldi*, Ltk., and *O. fallax*, Pet., are distinct.

On *Ophiocoma scolopendrina* (Lmk.), cf. HOFFMANN (8), p. 46. The identity or distinctness of *O. brevipes*, Pet., *insularis*, Lym., and *ternispina*, v. M. (and *aquamata*, M. Tr.), is discussed, but not settled; Lyman (10), p. 225. *O. alternans*, v. M., is probably the young of *O. scolopendrina*; but *O. picta* (p. 225, pl. vii. figs. 2-4) is an *Ophiarthrum*, differing from *Ophiocoma* in its naked disc.

Ophiomastix flaccida, sp. n., Lyman (10), p. 226, pl. vi. figs. 14 & 15 Philippines).

Ophioplocus esmarki, sp. n., *id.* l. c. p. 227, pl. v. figs. 12-14, pl. vi. fig. 6 (California).

Amphiura planispina, v. M., is not a *Hemipholis*, as it has three mouth-papillæ on each side; *A. lævis*, sp. n., p. 229, pl. iv. fig. 18-21 (Philippines), also belongs to *Amphipholis*, Ljgm., Ltk.; likewise *Ophiocnida* (*Ophiophragmus*) *echinata*, Ljgm.? (*longipeda*, Lym., MS.) (Philippines), p. 229, pl. vi. figs. 7-9: *id.* l. c.

Ophionephthys (?) *phalerata*, sp. n., p. 229, pl. vi. figs. 7-9 (Philippines); Lyman, *l. c.*

Ophiopsammium, g. n. (nearest allied to *Ophiothela*) [the name can hardly be retained, because of its resemblance to *Ophiopsammus*, Ltk.]. Numerous tooth-papillæ arranged in a vertical mass, as in *Ophiothrix*; no mouth papillæ; disc and arms naked below, closely granulated above; arm-spines stout, thorny, on a crest-like arm-plate, as in *Ophiothrix*; tentacles long, covered with papillæ and issuing from the sides of the arms, which have a tendency to roll on themselves, as in *Ophiochondrus*. *O. semperi*, sp. n., *id. l. c.* p. 232, pl. iv. figs. 11-17.

Ophiocnemis obscura, Ltk., is not Ljungman's species, but *O. (Ophiomaza) cacaotica*; *id. l. c.* p. 233.

Notes are given on *Ophiothrix comata*, M. Tr. (*l. c.* p. 233, pl. iv. figs. 27 & 28; allied to *O. suensoni*, but apparently distinct); *O. fumaria*, M. Tr. (pl. iv. figs. 33-36); *O. ciliaris*, M. Tr. (pl. iv. figs. 29-32); *O. aspidota*, M. Tr. (p. 234); *O. propinqua*, Lym., wrongly described by the Recorder as the young of *O. longipeda*; *O. clypeata*, Ljgm., is the young of an *Ophiocnemis (marmorata?)*. The following new species are described:—*O. martensi*, p. 234, pl. iv., *pusilla*, p. 235, pl. iii. figs. 21-30, *exigua*, p. 236, pl. iv. figs. 24-26, and *plana*, p. 238, pl. iv. figs. 1-8 (Philippines); *stelligera*, p. 237, pl. iii. figs. 15-20 (Philippines and Borneo); *rudis*, p. 339, pl. iii. figs. 11-14 (California). After a critical discussion of the European species, eight types are pointed out, of which five or six however are doubtful:—1, *Ophiothrix fragilis* (Abgd.), = *O. rammelsbergi*, M. Tr., *alba*, Gr. (Scandinavia, Færø, Iceland); 2, *O. quinquemaculata*, (d. Ch.) Ltk. (Mediterranean); 3, *O. echinata*, M. Tr. (Mediterranean); 4, *O. alopecurus*, M. Tr. (Adriatic); 5, *O. pentaphyllum*, (Pnt.) Ljgm. (British and French shores); 6, *O. lusitanica*, Ljgm. (France, Portugal, Madeira); 7, *O. maculata*, Ljgm. (Josephina Bank); 8, *O. luetkeni*, W. Th. (Atlantic, abyssal). Lyman (10).

Astrophyton cacaoticum, p. 250, pl. vi. figs. 1-3 (Guadeloupe), *nudum*, p. 251, pl. vi. figs. 4 & 5 (Philippines); *id. l. c.* spp. nn.

The likeness in external appearance, colours, &c. ("mimicry") of *Hemieuryale pustulosa* and *Gorgonella guadelupensis*, d. M., on which it lives, is commented upon by Möbius, Schr. Ver. Schlesw. Holst. i. pp. 204-206).

An abstract of the Recorder's paper on new or little known *Ophiuridae* [1872, Zool. Rec. ix.] is given in J. Zool. ii. pp. 444-450.

CRINOIDÆ.

Holopus rangii, d'Orb. (ten-armed), and *Rhizocrinus rawsoni*, Pourt. (Barbadoes), are figured and shortly described by Pourtales (2), pp. 51-52, & 27-31, pls. x. & v. In *Holopus*, the mouth is surrounded by five triangular plates, by which it can apparently be almost or entirely closed; an "anal" plate was visible, but no opening could be detected near it; sutures could not be ascertained in the lateral body-wall; some details are figured, for comparison, of *R. lofotensis* from Florida; it is here always 5-armed, and no enlarged upper stem-joint has, as supposed

by Sars, entered into the basal part of the calyx. The most nearly allied genus is *Belemnocrinus*.

Upon a petrefaction from Köpinge (Sweden), viz., the central knob of an *Antedon*, with conspicuous basalial and adherent first radialia, B. Lundgren (Om en *Comaster* från Köpinge; Öfv. Ak. Förh. 1874, pp. 61-74, pl. iii.) demonstrates the identity of *Comaster*, *Solanocrinus*, and *Glenotremites*; when the knob alone is found, it is *Glenotremites*; when the basalial and 1st radialia are in place, *Comaster*.

F. Schmidt (14) describes and figures silurian species of *Hybocrinus* (*Baerocrinus*), *Glyptocystites* (*Cheirocrinus*, Eichw.), including *G. volborthi*, p. 20, figs. 4-6, 8, and *sculptus*, p. 22, figs. 9 & 10, pl. ii., spp. nn., *Blastoidocrinus*, *Asteroblastus*, Eichw., including *A. volborthi*, p. 32, figs. 6-8, and *tuberculatus*, p. 33, fig. 9, pl. iii., spp. nn., *Agelacrinus*, *Bothriocidaris*, including *B. pahleri*, sp. n., p. 38, pl. iv. fig. 1 a-g, and *Tetradium* ||, g. n., p. 42, type, *T. wrangeli*, sp. n., *ibid.*, pl. iv. figs. 3-8.

F. B. Meek comments on the species of Crinoids, &c., figured in the fifth volume of the Illinois State Geological Report [Zool. Rec. x. p. 503], the descriptions given in that work being only reprints of those previously published and requiring further explanations, which are now supplied. Am. J. Sci. (3) vii. pp. 189-193, 369-376, 484-488.

QUENSTEDT'S work on the *Echinodermata* of Germany [Zool. Rec. x. p. 503] has been finished. COTTEAU'S, on those of France, terminal portion of vol. ix., "Échinides irréguliers de la formation jurassique" (Paléontologie Française), and WRIGHT (Pal. Soc.) on those of England, are continued. E. BUCAILLE: "Échinides fossiles du département de la Seine Inférieure"; Bull. Soc. Géol. de Normandie, i. 1873, p. 57. COTTEAU: "Sur les oursins des Antilles Suédoises;" Bull. Soc. Géol. (3) ii. 2, p. 125. J. TARAMELLI: "Di alcune echinidi eocenici dell'Istria;" Atti Ist. Venet. (4) iii. pp. 951-976, pls. iii. & iv. H. WOODWARD: Description of a new devonian star-fish (*Helianthaster filiciformis*), with list of palæozoic starfishes described; Geol. Mag. (2) i. pp. 6-10, additions, pp. 96, 238 & 432.

Ophiolepis damesii (Rhætian, Hildesheim) described by Wright, Z. geol. Ges. xxvi. p. 821, pl. xxix. fig. 5. A note on *Pentacrinus gastaldii* by A. Manzoni, Boll. Com. Geol. Ital. v. pp. 152-159.

CŒLENTERATA.

BY

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ANTHOZOA.

1. DARWIN, C. The structure and distribution of coral reefs. 2nd edit. London: 1874. Cf. J. D. Dana, Am. J. Sci. (3) viii. pp. 312-318; Nature, x. pp. 353-355, 408-410.
2. DYBOWSKY, W. N. Monographie der *Zoantharia sclerodermata rugosa*, aus der Silurformation Estlands, Nord-Livlands und der Insel Gotland (Fortsetzung). Arch. Nat. Livl. v. pp. 415-526, pls. iii.-v.
3. KOCH, G. VON. Anatomie der Orgelkoralle (*Tubipora hemprichi*, Ehrbg.), ein Beitrag zur Kenntniss des Baues der Zoophyten. Jena: 1874, 26 pp. pls. 2. Abstract, Z. ges. Naturw. (2) xlv. pp. 479 & 480.
4. KOREN, J., & DANIELSSEN, D. C. Bidrag til de ved den norske Kyst levende Pennatuliders Naturhistoire. N. Mag. Naturv. xii. pp. 422-427.
(A preliminary account.)
5. KÖLLIKER, A. Ueber den Bau und die systematische Stellung der Gattung *Umbellularia*, eine vorläufige Mittheilung. Verh. Ges. Würzb. (2) viii. pp. 13-18. Abstract, Z. ges. Naturw. (2) xlv. pp. 284 & 285.
6. —. Die Pennatulide *Umbellula* und zwei neue Typen der Alcyonarien. Festschrift z. Feier d. 25-jährigen Bestehens d. physik. medic. Ges. in Würzburg. Würzburg: 1874, 24 pp. 2 pls. (phot.).
7. LEUCKART, R. De zoophytorum et historia et dignitate systematica. Lipsiæ: 1873.
(University programme.)
8. LINDAHL, J. Om Pennatulidslägtet *Umbellula*. Sv. Ak. Handl. xiii. No. 3, 22 pp. 3 pls.

Preliminary accounts are given in Ann. N. H. (4) xiii. p. 258, and Förh. Sk. Naturf. xi. pp. 377-379.

9. [AGASSIZ, A., &] POURTALES, L. F. DE. Zoological results of the Hassler Expedition. I. [*Echini*, Crinoids, and] Corals. Cat. Mus. C. Z. viii. Deep sea corals, pp. 33-50, pls. vi.-ix.
10. STEARNS, E. C. : Description of a new genus and species of Alcyonoid Polyp. J. BLAKE : On the structure of *Verrilia blakei*. Tr. Cal. Ac. v. pp. 147-150, pl. ix.
11. TARGIONI-TOZZETTI, G. Nota intorno ad alcune forme di *Alcionarii* e di *Gorgonacei*, &c. Atti Soc. Ital. xv. 5.

ANATOMY, REPRODUCTION, ETC.

KOCH (3) has studied the anatomy and histology of *Tubipora* preserved in spirits. The walls of the polype and of its invaginated portion are composed of ectoderm, mesoderm ["*Stützmembran*"], and endoderm: the calcareous spicules are developed in the mesoderm; muscular elements are only found in the tentacles (not in their pinnulæ) and septa, on one side of which only they are however developed. All the septa have "mesenteric filaments" nearest to the "pharynx"; in two of them, which are approximate and have their muscular layer on their opposed surfaces, the filaments are continued to the base; in the other six, they are replaced by the generative capsules.

LUDWIG [*suprà*, p. 495] on the formation of the egg in *Cœlenterata*, pp. 37-39.

For anatomical details concerning *Umbellula*, *Heterozenia*, and *Siphonogorgia*, cf. the papers of KÖLLIKER (6) and LINDAHL (8). P. FISCHER has observed spontaneous fissiparity in *Anemonia sulcata* and *Sagartia ignea*, and reproduction by small fragments left by the foot, in *S. pellucida*; C.R. lxxix. p. 1210.

A. AGASSIZ briefly reviews an important paper (in Russian, not seen by the Recorder) by A. Kowalewsky, on the embryology of various *Cœlenterata* (*Campanularia*, *Rhizostoma*, *Cassiopea*, *Pelagia*, *Actinia*, *Alcyonium*, *Astræa*, *Gorgonia*, *Cerianthus*, *Eschscholtzia*, *Beroë*, *Eucharis*); Am. J. Sci. (3) viii. p. 470.

A note "Sur l'époque de la reproduction et de la ponte ou naissance de l'*Astroïdes calycularis*," by H. DE LACAZE-DUTHIERS, Arch. Z. expér. iii. pp. lvi. & lvii.

Faunas, Local Lists, &c.

POURTALES (9) enumerates the deep-sea corals collected on the "Hassler" expedition, especially off Barbadoes, a few also off Brazil and Juan Fernandez; those collected by the late W. Stimpson in the waters of Florida, Cuba, and Yucatan are also recorded. The species described or figured are enumerated below. The existing West Indian fauna of deep-sea corals agrees much more with the corresponding recent and tertiary European fauna than with the tertiary West Indian. P. FISCHER enumerates 31 species of *Actiniidæ*, 4 of corals, and 3 of *Gorgoniidæ* from the west coast of France; of the former 25

are known from the shores of Great Britain; C. R. lxxix. pp. 1207-1210. McINTOSH records the *Anthozoa* of St. Andrews, with brief notes; Ann. N. H. (4) xiii. pp. 218-221: compare also the papers of VERRILL, WHITEAVES, and MÖBIUS quoted above [p. 493]. A paper by C. W. PEACH on British Madreporæ, read before R. Phys. Soc. Edinb., March 25, 1874, has not been seen by the Recorder. "Un mot sur la pêche du corail en Afrique en 1873," by H. DE LACAZE-DUTHIERS; Arch. Z. expér. iii. pp. xlvii, & xlviii.

POLYACTINIA.

Observations on the numbers of cycles and tentacles in *Actinixæ*, Fischer, l. c. p. 1209.

Cerianthus borealis, Verrill, P. Am. Ass. 1873, p. 391.

Urticina nodosa (Fabr.), *id.*, Am. J. Sci. (3) vii. pl. vii. fig. 7; *Edwardsia farinacea*, *id.* l. c. pl. viii. fig. 4, and P. Am. Ass. l. c. pl. vi. fig. 1.

Caryophyllia berteriana, Duch.; Pourtalès (9), p. 39, pl. vi. figs. 1 & 2 (Barbadoes, 100 fath.): a few specimens have young ones growing from the wall. *C. antillarum*, sp. n., *id.* l. c. p. 34, pl. vi. figs. 3 & 4 (Barbadoes).

Bathycyathus maculatus, sp. n., *id.* l. c. p. 34, pl. vi. figs. 5 & 6 (off Abrolhos Isl., near Bahia, 30 fath.).

Trochocyathus rawsoni, sp. n., *id.* l. c. p. 35, pl. vi. figs. 7-10 (Barbadoes, Florida, 100 fath.).

Deltocyathus agassizi, var. n. *calcar*, *id.* *ibid.* pl. vi. fig. 11 (Barbadoes, Florida, Yucatan, Havannah, 100-413 fath.).

Schizocyathus, g. n., *id.* *ibid.* Coral simple, without epitheca or costæ; no columella; pali in front of the last cycle, united in front of the penultimate; propagation by internal gemmation. Buds inside the calyces, generally on the secondary septa; by their growth, the parent is split along the primary septa, a strip comprising one or rarely two systems remaining permanently attached to the new individual. *S. fissilis*, sp. n., *id.* l. c. p. 36, pl. vi. figs. 12 & 13 (Barbadoes, 100 fath.).

Sphenotrochus auritus, sp. n., *id.* l. c. p. 37, pl. vi. figs. 14 & 15 (Cape Frio, 35 fath.; young ones, coast of Brazil, 12-18 fath.).

Paracyathus defilippii, D. M. (*P. confertus*, P., olim, = *P. agassizi*, Dunc. ?); *id.* l. c. p. 38 (Barbadoes, Florida).

Galaxea eburnea, Pourt., is a young *Desmophyllum*; *id.* *ibid.*

Flabellum brasiliense, sp. n., *id.* *ibid.* pl. vi. figs. 16 & 17 (coast of Brazil, 40 fath.); = "*Euphyllia*" *spinulosa*, Dana, according to a note in Am. J. Sci. (3) viii. p. 73.

Rhizotrochus tulipa, sp. n., *id.* l. c. p. 39, pl. vi. figs. 18 & 19 (Barbadoes, 100 fath.).

Cænosmilia, g. n., *id.* *ibid.*; *Parasmilie* propagating by gemmation and thus becoming compound. *C. arbuscula*, sp. n., *id.* *ibid.* pl. vii. fig. 1 (Barbadoes, 100 fath.).

Lophosmilia rotundifolia, E. H.; *id.* l. c. p. 40, pl. vii. figs. 2 & 3 (Barbadoes).

Axohelia (*Stylophora*) *dumetosa*, Duch.; *id. ibid.* pl. viii. fig. 1 (Barbadoes, 100 fath., St. Thomas ?, coast of Brazil); *A. schrammi*, sp. n., *id. l. c.* p. 41, pl. viii. fig. 2. *Axohelia* is retained for the species with compact coenenchyma, *Madracis* for those in which it remains cellular.

Antillia explanata, sp. n., *id. l. c.* p. 42, pl. viii. figs. 4-6 (Barbadoes, 75 fath.). *Antillia* has hitherto been held as an extinct genus; it is distinct from *Lithophyllia* by the epitheca on its lower surface and the small point of attachment.

Cladocora patriarc[h]a, sp. n., *id. ibid.* pl. vii. fig. 7 (Cape Frio, 35 fath.).

Cladangia exusta (Stp.). The Recorder's paper on this species reprinted in abstract, Arch. Z. expér. iii. p. xxix. & xxx.; J. Zool. iii. pp. 321-324.

Stylaster punctatus, Pourtalès, *l. c.* pl. vii. figs. 8 & 9 (Barbadoes, 100 fath.).

Distichopora barbadensis, sp. n., *id. l. c.* p. 43, pl. vii. fig. 10 (Barbadoes); *D. cervina*, *id. ibid.* pl. vii. fig. 11.

Balanophyllia floridana, *id. ibid.* pl. vi. fig. 10 (Barbadoes).

Mycedium caileti, D. M.; *id. l. c.* pl. ix. figs. 1 & 2 (Barbadoes).

Gwynia annulata, Dunc.; *id. l. c.* p. 44, pl. ix. figs. 3 & 4 (Barbadoes).

Duncania, g. n., *id. l. c.* p. 45. Corallum attached, cylindrical, covered with a thick wrinkled epitheca, rising over the border of the calicle; interseptal chambers filling up solidly from the bottom; a multiple pillared columella; sometimes paliform lobes. *D. barbadensis*, sp. n., *id. ibid.* pl. ix. figs. 5-7, with description of the animal (Barbadoes).

Antipathes (*Cirripathes*) *desbonnii*, D. M., p. 46; *A. (Arachnopathes) columnaris*, D., *ibid.* pl. ix. fig. 8; *A. humilis*, *ibid.* pl. ix. fig. 9; *A. abictina*, sp. n., p. 47, pl. x. fig. 10 (all from Barbadoes, 100 fath.); *A. fernandezi*, sp. n., p. 47 (Juan Fernandez, 65-220 fath.): *id. l. c.* The central column in *A. columnaris* is the habitation of an Annelid, as in *Lophelia prolifera*, &c.

FOSSIL CORALS.

R. ETHERIDGE: Observations on *Chaetetes tumidus*, Phill.; Ann. N. H. (4) xiii. pp. 194-196, pl. xi. figs. 1-3. A. H. NICHOLSON: On *Duncanella*, a new genus of palæozoic corals, *tom. cit.* pp. 333-335; Descriptions of species of *Chaetetes* from the lower silurian rocks of North America, J. G. Soc. 1874, pp. 439-515, pls. xxix.-xxxi.; abstract, Z. ges. Naturw. (2) xi. p. 77; On the species of *Favosites* of the Devonian rocks of Western Ontario, Canad. Nat. (n.s.) xiv. p. 38; On *Columnopora*, a new genus of tabulate corals, Geol. Mag. (n.s.) i. pp. 253-254; Descriptions of new fossils from the Devonian formation of Canada West, *l. c.* pp. 10-16, 54-60, pls. ii. & iii.. J. THOMSON: Descriptions of new corals from the carboniferous limestone of Scotland; *tom. cit.* pp. 556-559, pl. xx. The elaborate paper of the late A. E. v. REUSS, on the older tertiary Alpine corals [Zool. Rec. x. p. 509], is published in Denk. Ak. Wien, xxxiii. pp. 1-60, pls. xxxvii.-lvi.

OCTACTINIA.

Ptilella grandis (Ehrbg.) = *Pennatula borealis*, Sars; Koren & Daniels-sen (4), p. 422.

Pennatula aculeata, and var. *rosea*, and *P. distorta*, sp. n., iid. l. c. p. 423 (Norway).

Virgularia affinis (= *glacialis* and *steenstrupi*, Köll.), iid. l. c. p. 424.

Batea ||, g. n., iid. l. c. Approaching *Stylatula* in habit. Stem with a terminal vesicle; rhachis with a rather long lateral zooid-stripe and radial channels branching from the dorsal and ventral canal, producing a feeble swelling on the dorsal and ventral surface; finlets rudimentary, fortified by a calcareous plate, composed of shorter and longer spicules, which project far over the rudimentary finlet; polyps without cells, long, cylindrical, hardly contractile, coalesced at the base; sexual organs in the hypogastric cavity of the fully-developed polyps; zooids lateral; axis cylindrical, with numerous radiating fibres. *B. abyssicola*, sp. n., iid. l. c. p. 425, and var. n. *smaragdina* (Norway), also *B. (Stylatula, Köll.) elegans* (Dan.), pp. 425 & 426.

Lygomorpha, g. n., iid. l. c. Small robust sea-pens; end of stem club-shaped; ventral surface roundish, broad and naked; cells thick, sessile, placed alternately on the back and sides; orifice semilunar, with two strong teeth; polypes retractile; zooids few, scattered on the dorsal surface; calcareous spicules in the cells, tentacles, and sarcosome; axis cylindrical. *L. sarsi*, sp. n., iid. l. c. p. 426 (Norway).

Cladiscus ||, g. n., iid. l. c. Small rigid sea-pens; cells separately placed on the rhachis in alternating rows, provided with eight longitudinal ribs, and eight papillæ round the orifice; polyps robust, retractile; zooids ventral; no calcareous spicules. *C. gracilis*, sp. n., iid. l. c. pp. 426 & 427 (Norway).

LINDAHL'S investigation (8) of the structure of the two "cluster-polypes" discovered during the Swedish expedition to Greenland and Newfoundland in 1871, has induced the establishment of a third sub-family of *Pennatulæ*:—*Umbellulæ*. Coral bilateral, without finlets: polyps without calyces, of two different kinds, the lateral arranged in one longitudinal series on each side of the rhachis, the smaller (but perfectly developed) dorsal polyps arranged in somewhat irregular transverse rows; zooids in separate areas, crowded, lateral and ventral; rhachis about one-fortieth of the stem; calcareous axis quadrangular, with a deep longitudinal groove on each side. Genera: *Crinillum*, v. d. H.; "transverse section of the axis 4-lobed, with a rounded notch on each side; nucleus circular" (*C. siedenburgi*, Banka Sea, 2700 fath., only known from the axial skeleton); and *Umbellula*, Cuv., "transverse section of the axis 4-lobed, with the ventral notch rounded, and those of the three other sides rectilinear, forming angles of about 90°; nucleus doubly crescentic; no calcareous spicules." *U. miniacea*, Ldl. (Baffin's Bay, 70° 43' lat. N., 410 fath.), and *U. pallida*, Ldl. (entrance of Omenaks Fjord, 71° 27' lat. N., 122 fath.); none of them can be identified with *U. encrinus*, L., found in the year 1753 in 79° lat. N., 80 miles off

"Greenland" (viz., Spitzbergen !) in 236 fath. Generative products were not found in any of the polyps of either kind. The characters given by Lindahl (8) must be modified, inasmuch as Kölliker's (6) *U. thomsoni* (pp. 5-11, pl. i. figs. 1-5) has dorsal zooids and spicules in the sarcosome. The two specimens were found in 2125 fath., between Portugal and Madeira, during the "Challenger" expedition. Kölliker also discovered the sexual organs, which are fixed to four of the septa in the basal part of the polype. Lindahl's two species are only based on characters of age and different degrees of contraction of the soft parts; Kölliker therefore unites them as *U. lindahli* (which may however possibly be identical with *U. encrinus*, L.); and gives the character of the genus and family thus:—*Penanuleæ* with a long thin stem and a short thick polype-bearer, with strongly-pronounced bilateral symmetry on the ventral aspect; polypes very large, sessile, without calyces, not retractile, placed in lateral rows to the left and right on the dorsal aspect of the keel; also a terminal polype; sexual organs in the lowermost portion of the polypes, on four septa; zooids between and at the sides of the polypes, ventral, lateral or dorsal, leaving the ventral median line free; axis quadrangular, with rounded angles and four profound furrows.

A note by A. E. Verrill, Am. J. Sci. (3) vii. p. 70, accompanying the reprint of R. E. C. Stearn's second paper on *Verrilia blakii* [cf. Zool. Rec. x. p. 508], intimates that this genus is most nearly allied to *Halipteria christi* (K. D.), and probably should be referred to the same genus. The characters of the sub-genus *Verrilia* are given thus (10):—Polypidom linear-elongate, round, oval or ovate in cross section; axis round, slender, bony; polypes arranged in two unilateral longitudinal series; there are four large longitudinal canals in the basal portion of the stem; in the polypiferous portion, these are rudimentary, with the exception of the one turning towards the polypiferous wing-like dilatation of the sarcosome.

Heteroxenia, g. n., Kölliker (6). Habit and structure of *Xenia*; polypes not retractile, on the terminal disc of a thick fleshy stem, dimorphic; sexual polypes large, placed somewhat apart, those on the rim of the disc smaller; tentacles one-quarter or one-half longer than the body, with four rows of pinnulæ on each side; zooids much more numerous, filling all the intervals between the true polypes, freely prominent, cylindrical, mouth with four simple and very short tentacles; calcareous spicules as in *Xenia*, rarer in the interior of the stem, crowded in the endoderm of both kinds of polypes. *H. elizabethæ*, sp. n., *id. l. c.* pp. 12-17, pl. ii. figs. 7 & 8 (Port Denison). There is also a species of *Heteroxenia* in the Red Sea, but *Xenia umbellata*, Sav., *cærulea*, Ehrbg., and *Cæspitularia multipinnata*, Val., are true (not dimorphic) *Xenia*.

Siphonogorgia, g. n., *id. l. c.* Type of a new sub-family, between the *Gorgoniidæ* and *Alcyoniidæ*, with the habit of the former: sarcosome hard, formed of connective tissue and many calcareous spicules; polypes retractile, with slightly prominent calyces, which only occur at the ends of the smaller branches; intestinal cavities prolonged in the shape of channels, penetrating the whole polypary, in the interior of the stems and branches; only four of the septa are continued into these tubes, viz.,

two bearing the sexual organs and two the long narrow mesenteric rolls; genital products contained in the intestinal tubes of the lesser branches. In the genus characterized, there is much connective tissue in the sarco-some, especially round the intestinal tubes, and the calyces have slightly developed covers. *S. godeffroyi*, sp. n., *id. l. c.* pp. 18-23, pl. i. fig. 6 (Pelew Islands).

Cornulariella, g. n. Allied to *Cornularia* and *Telesto*; polypes tubular, rising from creeping stolons; walls of lower part of the polype-bodies thickened and stiffened by numerous large fusiform spicules with sharp conical projections, and more or less 8-ribbed in contraction; upper parts of body hour-glass shaped, flexible, translucent, with fewer spicula, retractile within the lower part; tentacles large, lanceolate, gradually tapering to the acute tips, flat above, with the short thick pinnulæ arranged along the upper edges on the distal half; lower side rounded, more or less swollen towards the base. *C. modesta*, sp. n. Verrill, *Am. J. Sci.* (3) vii. p. 40, pls. vii. fig. 7, viii. figs. 1 & 2; *P. Am. Ass.* 1873, p. 390, pl. vi. figs. 2 & 3 (Casco and Fundy Bay, &c.).

Alcyonium carneum, Ag.; *id. Am. J. Sci. l. c.* pl. viii. fig. 3, and *P. Am. Ass. l. c.* pl. vi. fig. 4.

HYDROZOA.

1. ALLMANN, G. J. Report on the *Hydroida* collected during the expeditions of H. M. S. Porcupine. *Tr. Z. S.* viii. pp. 469-481, pls. lxx.-lxxviii.
2. —. On the structure and development of *Myriothele phrygia*. *Ann. N. H.* (4) xiv. pp. 317-321; *Rep. Br. Ass.* 1874, pp. 135 & 136.
3. —. On a new order of *Hydrozoa*. *Ann. N. H. l. c.* pp. 237 & 238; *Nature*, x. p. 251.
4. BENEDEN, E. VAN. De la distinction originelle du testicule et de l'ovaire; caractère sexuel des deux feuillets primordiaux de l'embryon; hermaphrodisme morphologique de toute individualité animale; essai d'une théorie de la fécondation. *Bull. Ac. Belg.* (2) xxxvii. pp. 530-595, pls. i. & ii.; *J. Zool.* iii. pp. 396-452; abstract, *Arch. sci. Nat.* li. pp. 370-372.
5. —. Ueber die Abstammung der Diplophysen und über eine neue Gruppe von Diphyiden. *Nachr. Ges. Gött.* 1873, pp. 257-261.
6. CLAUS, C. Die Gattung *Monophyes* und ihr Abkömmling *Diplophysa*, Gbr. *Schriften zoologischen Inhalts*, Heft i. 2, pp. 25-33, pl. iv.
7. EIMER, J. Ueber künstliche Theilbarkert von *Aurelia aurita* und *Cyanea capillata* in physiologische individuen. *Verh. Ges. Würzb.* (n. s.) vi. pp. 137-161; *Zoologische Untersuchungen*, 1 Heft. pp. 45-68, pl. ii.
8. HINCKS, J. Notes on Norwegian *Hydroida* from deep water. *Ann. N. H.* (4) xiii. pp. 125-137.
9. —. On deep-water *Hydroida* from Iceland. *Tom. cit.* pp. 146-153, pls. vi.-viii.

10. HÄCKEL, E. Ueber eine sechszählige fossile Rhizostomen und eine vierzählige fossile Semiostomen. Jen. Z. Nat. viii. pp. 308-330, pls. x. & xi.
11. METSCHNIKOFF, E. Studien über die Entwicklung der Medusen und Siphonophoren. Z. wiss. Zool. xxiv. pp. 15-83.
12. PLESSIS, G. DU. Sur un cas de double génération alternante chez la *Campanularia (Clytia) volubilis*. Bull. Soc. Vaud. xii. pp. 429-435; abstract, R. Z. (3) ii. pp. xii.

F. E. SCHULZE has published a note, "Ueber das Präparieren von Quallen und Hydroidpolyphen," in Arch. Ver. Mecklenb. xxv. pp. 107 & 108.

Embryology, Anatomy, and Physiology.

VAN BENEDEN's investigation of the place of development of the generative products in *Hydractinia* (4) has led to the important discovery that the male element is developed from the ectoderm, the female from the endoderm. The "sporosacs" or gonophores are developed only from a special region of the gonosome, situated above the gastric region; in this region, the immature eggs—which are at this stage only large flagellate endodermal cells, with nuclei of a size much exceeding that of the ordinary endodermal cells—are discernible in the young gonosomes of the female colonies, at a time when the gonophores themselves have not begun to make their appearance as conical projections from the germinative region of the gonosome. But, in the female gonophores, is also developed, through a sort of invagination of the ectoderm, a rudimentary sperm-sac, which may be observed in the mature gonophore as a thin pellicle outside of the eggs, while in the male gonophores this same organ is fully developed and filled with spermatozoa. As far as, in the germinative region of the male gonosomes, endodermal cells are discernible, distinguished by nuclei of extraordinary size, and therefore comparable to the embryonic ova of the female gonosomes, a rudimentary ovary may also be said to be present in the male gonosomes. Generalizing from this discovery, the author considers the outer (animal) germ-leaf as being the male, and the inner (vegetative) germ-leaf as being the female, element in the composition of the embryo of higher animals. In addition, the recent histological discoveries in the *Hydrozoa* are confirmed for the *Hydractinia*; the ectodermal and endodermal cell-layers are separated by a structureless membrane, to the outer side of which the muscular fibrils, which are in continuation with the ectodermal cells, are fixed, &c. The gonosomes are not absolutely without mouth, a narrow orifice being left; rudimentary tentacles are present, in the shape of tubercles containing thread-cells.

METSCHNIKOFF has confirmed (11, pp. 17-27, pls. ii. & iii.), from continuous observations, the direct development from the egg, without any intervening gemmiparous hydroid generation, of certain lower *Medusæ* (*Geryonia* [*Carmarina*] *hastata*, *Polyzenia leucostyla*, W., = *Ægineta flavescens*, G., *Æginopsis mediterranea*, Müll.). The buds of *Cunina rhododactyla*, H., are found free in the stomach of the mother; when the

young *Medusa* is still very small and undeveloped, a blastostyle is produced from its aboral surface, and at least two *Cunina*-buds are developed on it; it is only after having got rid of this gemmiparous propensity that the temporarily arrested evolution is continued, and the characters of the adult *Cunina* acquired. The author (*l. c.* pp. 27-35, pl. v.) doubts if the young of *Cunina rhododactyla* were found by Hæckel in the stomach of *Geryonia hastata*; they probably belonged to some other species of *Cunina*—a question which materially affects Hæckel's theory.

According to DU PLESSIS (12), the same species of *Clytia*, which in winter produces true *Medusæ*, through gemmation from the axis of the gonophore, will in summer afford another kind of sexual reproduction, the gonophores being at this time themselves either male or female, according to the colonies, and containing either spermatozoa or eggs, or planuliform embryos.

EIMER'S (7) experiments demonstrate that the contractions of the disc in the *Discophora* originate in a narrow band fringing each of the eight marginal incisions, in which the "marginal corpuscles" are situated, and spread from these to all other parts of the disc. (Analogous observations on *Slabberia conica*, by G. J. Romanes, *Nature*, xi. p. 29.) The facts cannot be explained by the hypothetical presence of one or two nerve rings, but only by numerous nervous fibrils traversing the gelatinous substance in various directions, as in *Beroë* [*Zool. Rec.* x. p. 515]; their presence will be demonstrated in a future paper. The movements of the *Medusa*, though involuntary, are nevertheless under the influence of the will, as are the respiratory movements in higher types; in fact, their primary function is respiration, though they also discharge those of circulation and nutrition, the contractile zones mentioned above, and the adjoining parts of the gastrovascular system, acting as nutritive pumps.

H. FOI has communicated an abstract of his paper on the egg of *Geryonia* [*Zool. Rec.* x. p. 511] to *Arch. Z. expér.* iii. pp. xvii.-xix., not satisfied with that which appeared in *J. Zool.* iii. pp. 154-158, pl. iii. An account of KLEINENBERG'S "Researches on the anatomy and development of *Hydra*," is given in *Q. J. Micr. Sc.* xiv. pp. 1-18.

The knowledge of the earliest stages of *Siphonophora* (*Epibulia aurantiaca*, *Agalma sarsi*, *Halistemma rubrum*, *Hippopodius gleba*, *Stephanomia pictum*, &c.), is considerably advanced by METSCHNIKOFF'S studies (11, pp. 35-37, pls. vi.-xii.), which are the more reliable, as he was able to trace the evolution of several species from the ovum, without being restricted to the observation of the free swimming young ones. He opposes the current "polymorphic" theory of the *Siphonophora*, without however bringing forward any decisive argument against it, and concludes with a very suggestive comparison of the *Ctenophora* and larval Echinoderms.

Local Lists, Faunas, &c.

ALLMANN (1) reports upon the deep-sea *Hydrozoa* collected in the

British expeditions of 1869 and 1870, noting the station, depth, and bottom temperature for each species. With very few exceptions, they were *Calyptriblastica*, with fixed sporosacs, especially *Plumulariidae*. Several species (e. g., *Sertularella polyzonias*, *Hydrallmania falcata*, and *Thuiaria articulata*) have an astonishingly wide bathymetrical range. HINCKS (9) reports upon 17 species dredged off Reikiavik, by Dr. Wallich, in 100 fathoms; they all belong to the *Calyptriblastica*. Many northern *Hydrozoa* are distinguished by their large size, compared with that of the same species on the British shores. MACINTOSH (Ann. N. H., 4, xiii. pp. 204-217) enumerates the species of *Hydrozoa*, *Medusæ* (2), *Calycosoa* (1), and *Ctenophora* (2), of St. Andrews; KIRCHENPAUER (Zweite deutsche Nordpolarfahrt, ii. pp. 411-417), the four species of Hydroids collected on the east coast of Greenland by the German expedition, and those found at Spitzbergen (4 sp.) by Heuglin (Reisen, ii. p. 259). Cf. also the papers of VERRILL and WHITEAVES quoted above [p. 493]. The occurrence of *Stomobrachium octocostatum* at Kiel is noticed by MÖBIUS, Schr. Ver. Schlesw. Holst. i. p. 5.

Genera, Species, &c.

LEIDY, on the species of *Hydra* common in the neighbourhood of Philadelphia; P. Ac. Philad. 1874, p. 10 (*H. fusca* and *viridis*).

Hydractinia monocarpa, sp. n., Allman, Nature, xi. p. 179 (Spitzbergen); *Cladocoryne pelagica*, sp. n., *id. ibid.* (Gulfweed); *Amalthæa islandica*, sp. n. *id. ibid.* (Iceland).

Hydrodendron [Zool. Rec. x. p. 514], Hincks (8), p. 132. Zoophyte plant-like, much branched, rooted by a creeping stolon; hydrothecæ biserial, tubular, jointed to a short lateral process from the stem; polypites very large, partially retractile; tentaculoid appendages minute, filiform, naked, terminating above in a subglobose capitulum filled with thread-cells, distributed on the stem and branches, one below each calycle; gonothecæ unknown. Type, *Halecium gorgonoide*, Sars.

Ophionema [Zool. Rec. l. c.], *id. l. c.* p. 131. Shoots small, simple or slightly branched, jointed, not regularly pinnate or plumose, attached by a creeping stolon; hydrothecæ sessile, unilateral, cup-shaped; tentaculoid organs distributed singly on the shoots, extensile, filiform, terminating above in a globular capitulum filled with thread-cells, and protected at the base by a chitinous cup; gonothecæ large, borne singly near the base of the shoots; polypites not retractile within the calyces. Type, *Ophiodes parasitica*, Sars.

Lafoea grandis, sp. n., *id.* (9) p. 148, pl. vi. figs. 1 & 2, = *L. fruticosa*, G. O. Sars (Iceland, 100 fath.); *L. fruticosa*, M. Sars, *id. ibid.* pls. vi. figs. 6-10, vii. fig. 16; *L. dumosa* (Fl.), *id. ibid.* pl. vi. fig. 3; *L. halecioides*, Allman (1), p. 472, pl. lxvi. fig. 1 (cold area between Shetland and Færø, 345-640 fath.).

Campanularia grandis, sp. n., Allman, Nature, xi. p. 179 (Japan).

Calycella syringa (L.), Hincks (9), p. 148, pl. viii. fig. 24 (Labrador, Iceland, 100 fath.); *C. pygmæa*, Ald., *id. ibid.* pl. vii. fig. 15; *C. quadriden-*

tata, sp. n., *id. l. c.* p. 149, pl. viii. figs. 17–20 (Iceland, 100 fath.); *C. obliqua*, sp. n., *id. ibid.* pl. vi. figs. 4 & 5.

Halecium crenulatum, sp. n., *id. l. c.* p. 150, pl. viii. figs. 21–23 (Iceland).

Sertularia arctica, sp. n., Allman, *Nature*, xi. p. 179 (Spitzbergen).

Gemminella, g. n., *id. ibid.* [anticipatory notice of P. L. S., Dec. 17th, 1874]; a *Sertularia*-like form, in which the hydrothecæ, instead of being situated on the opposite sides of the stems, are all brought to the front of the stem, and there become adnate to one another in pairs [no type or locality given].

Sertularella polyzonias (L.), var. n. *gigantea*, Hincks (9), p. 151, pl. vii. figs. 11 & 12, and *S. geniculata*, sp. n., *id. l. c.* p. 152, pl. vii. figs. 13 & 14 (Iceland); *S. gayi*, var. n. *robusta*, Allman (1), p. 474 pl. lxvi. fig. 3 (North Atlantic, 203–605 fathoms); *S. episcopus*, sp. n., *id.*, *Nature*, xi. p. 179.

Diphasia coronifera, sp. n., Allman (1), p. 474, pl. lxvi. fig. 2 (North Atlantic, 632 fath.).

Thuiaria laxa, sp. n., *id. l. c.* p. 472, pl. lxv. fig. 1 ("cold area," 363–640 fath.); *T. hippuris*, sp. n., *id. l. c.* p. 473, pl. lxv. fig. 2 (640 fath.); *T. salicornia*, sp. n., *id. ibid.* fig. 3 (west of Færø, 114 fath.); *T. coronata* and *cerastium*, spp. nn., *id. ibid.*, *Nature*, xi. p. 179 (Japan).

Aglaophenia (restr.), Allman (1). Hydrocaulus pinnate; hydrothecæ usually with an intrathecal ridge; nematophores fixed; one lateral on each side of the orifice of the hydrotheca; mesial adnate to its front for a greater or less extent; gonangia included in corbulæ, each of which replaces an ordinary pinna. *A. dromaius*, p. 475, fig. 1, and *elongata*, p. 476, fig. 2, spp. nn., *id. l. c.* pl. lxvii. (off Spain, 539 fath.).

Macronychia ? *insignis*, sp. n., *id.* *Nature*, xi. p. 179 (Ceylon).

Halicornaria (Busk, modif.), *id.* (1). Differing from *Aglaophenia* (Allm.) by the gonangia not being included in corbulæ, or protected by gonangial branches (*Pl. pennatula*, Lam.). *H. ramulifera*, sp. n., *id. l. c.* p. 477, pl. lxvii. fig. 3 ("cold area," 640 fath.).

Cladocarpus, g. n., *id. l. c.* Differing from *Aglaophenia* by the gonangia not being included in corbulæ, but borne on the sides or at the base of special protective branches, which are appendages of the pinnæ; mesial nematophore occasionally free, not adnate to the front of the hydrotheca. *C. formosus*, sp. n., *id. l. c.* p. 478, pl. lxviii. fig. 1 (North Atlantic, 167 fath.).

Diplopteron, g. n., *id. l. c.* Hydrocaulus plumose (doubly pinnate); nematophores moveable, never adnate to the hydrotheca, which is destitute of intrathecal ridge; two pairs of lateral nematophores flanking the hydrotheca; gonangia not protected by corbulæ or by special ramuli. *D. insigne*, sp. n., *id. l. c.* p. 479, pl. lxviii. fig. 2 (S. W. of Spain, 364 fath.).

Taxella, g. n. Hydrothecæ and nematophores formed on the type of those of *Aglaophenia*, but gonophores not protected by corbulæ; ramification doubly pinnate. *T. eximia*, sp. n. *Id.*, *Nature*, xi. p. 179, (Ceylon).

Stephanoscyphus mirabilis, *id.* (3). Type of a new order, *Theco-*

medusæ: compound *Hydrozoa*, the zooids of which are included in hydrothecæ, but, instead of being constructed like hydranths, are formed on the plan of a *Medusa*, a circular canal surrounding the terminal orifice, below the tentacular crown, and four symmetrically disposed canals running longitudinally backwards in the body. No manubrium, velum, lithocysts, ocelli, or reproductive organs were detected. Shores of Southern France; its chitinous tubes are imbedded in a horny sponge, which lives attached to the ground at a slight depth below the surface of the sea.

Diplophysa, Ggbr. (= *Ersæa*, Will. ?), of which two forms are distinguished, is, according to CLAUS (5 & 6), the monogastric or *Eudoxia*-state of *Monophyes*, a new genus of *Diphyidæ*, with a single medusiform nectocalyx, in the funnel-shaped lateral channel of which the axis, with its polymorphic zooids, is more or less concealed. Of *Monophyes*, two species, *gracilis* and *irregularis*, are distinguished; similar or identical forms have however been described by Pagenstecher and Huxley (*Sphaeronectes kalliokeri*). The identity of structure of the urticating organs and the polypites in *Diplophysa* and *Monophyes*, leaves no doubt of their genetic connection. *Diplophysa* therefore cannot, as suggested by Metschnikoff (11), be the *Eudoxia*-state of *Praya*. Interesting observations on amœboid actions of ectodermal and endodermal cells in *Siphonophora* are given.

FOSSIL MEDUSÆ, GRAPTOLITES, &C.

Of two new fossil jellyfishes from the lithographic slate at Pappenheim, described by Hæckel (10), *Hexarhizites* (g. n.) *insignis*, is the type of a new family of *Rhizostomeæ*, distinguished by the presence of 6 "antimera," all other known *Rhizostomeæ* being tetrameral. *Semæostomites* (g. n.) *zittelli* belongs to the higher *Medusæ*, with a single open mouth, but its position could not be fixed more precisely.

W. DAMES, Beitrag zur Kenntniss der Gattung *Dictyonema*, Hall (Z. geol. Ges. xxv. pp. 383-387, pl. xii. figs. 5-8; abst., Z. ges. Naturw. 2, xliii. p. 261), confirms the reference of *Dictyonema* to the Graptolites. HOPKINSON: The Graptolites of the Arenig rocks of St. David's, South Wales (abstr., P. Liverp. Geol. Soc. 1872-1873, p. 36). J. & J. YOUNG: On *Palæocoryne* and other polyzoal appendages (J. G. Soc. 1874, pp. 684-687, pls. xlii. & xliii.); the authors attempt to show that *Palæocoryne* is only one type of the processes of many kinds which were given off by several palæozoic *Polyzoa*.

CTENOPHORA.

A. AGASSIZ. Embryology of the *Ctenophoræ*. Mem. Am. Ac. x. pp. 355-398, pls. i.-v.; abstr., Am. J. Sci. (3) viii. pp. 471-476.

A full account is given of the evolution of *Idyia roseola*, a more abridged one of that of *Pleurobrachia rhododactyla*, and a short exposition of the differences met with in *Mertensia ovum* and *Bolina alata*. The evolution of the latter more aberrant genus comes nearest to the idea of

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a metamorphosis, the young ones being without lobules, but provided with tentacles, which are lost before attaining the adult state, &c. In the concluding chapter, Agassiz attacks Hæckel's "*Gastræa* theory" [vide *infra*, p. 533], urging, that the walls of the primitive gastric cavity are in *Actiniæ*, worms, and Hydroids formed by the endoderm, in Echinoderms, *Ctenophora*, and some *Discophora* by the ectoderm; the "*Gastrulæ*" of these two types therefore cannot be regarded as homologous. In advocating the homologies between *Ctenophora* and larval Echinoderms, Agassiz agrees in the main with Metschnikoff, though differing in some particulars. *Ctenophora* should be placed with Echinoderms in one great division, or the *Acalephæ* divided in *Medusidæ* (*Discophora* and *Hydroida*) and *Ctenophora*, these being, on account of their embryology, more closely allied to Echinoderms than the other *Acalephæ*. Agassiz's criticism of Hæckel's theory is translated in Arch. Z. expér. iv. pp. ix.-xiii.

PROTOZOA.

BY

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SPONGOZOA.

1. BOWERBANK, J. S. Contributions to a general history of the *Spongiadae*. Pt. vi. P. Z. S. 1874, pp. 298-305, pls. xlvi. & xlvii.
2. CARTER, H. J. On the Spongozoa of *Halisarca dujardini*. Ann. N. H. (4) xiii. pp. 315 & 316.
3. —. On *Halisarca lobularis*, Schm., off the south coast of Devon, with observations on the relationship of the Sponges to the Ascidi-ans, and hints for microscopy. L. c. pp. 433-440.
4. —. On the nature of the seed-like body of *Spongilla*; on the origin or mother-cell of the spiculæ, and on the presence of spermatozoa in the *Spongida*. Op. cit. xiv. pp. 97-111.
5. —. Descriptions and figures of deep-sea Sponges and their spicules from the Atlantic Ocean, dredged up on board H.M.S. "Porcupine," chiefly in 1869; with figures and descriptions of some remarkable spicules from the Agulhas shoal, and Colon, Panama. L. c. pp. 207-221, 245-257, pls. xiii.-xv.
6. —. Development of the marine Sponges from the earliest recognizable appearance of the ovum to the perfected individual. L. c. pp. 321-337, 389-406, pls. xx.-xxii.
7. —. Further instances of the Sponge-spicule in its mother-cell. L. c. pp. 456-458, pl. xxi. figs. 26 & 27.
8. GRAY, J. E. On the arrangement of Sponges. Op. cit. xiii. pp. 284-290.
9. HADLOW, H. The *Hyalonema mirabilis*. Tr. A. S. Japan, for 1872-1873: 1874, pp. 10-19. [A general descriptive account.]
10. HIGGIN, T. On the structure of the skeleton of *Euplectella aspergillum*. Ann. N. H. (4) xiii. pp. 44-48, pl. iii. (with an introductory note by T. J. MOORE).

11. METSCHNIKOFF, E. Zur Entwicklungsgeschichte der Kalkschwämme. Z. wiss. Zool. xxiv. pp. 1-14, pl. i.; Ann. N. H. (4) xvi. pp. 41-43, pl. ii.

Distribution, Local Lists, &c.

McINTOSH gives a list of the *Spongiidæ* of St. Andrew's; Ann. N. H. (4) xiii. pp. 142-145. The Sponges are also noticed in the papers of WHITEAVES and VERRILL quoted above [p. 493]. O. SCHMIDT has recorded the siliceous, and E. HÄCKEL the gelatinous and calcareous, Sponges collected during the 2nd German Polar expedition (Zweite Deutsche Nordpolarfahrt, ii. pp. 428-436).

Embryology, Anatomy, &c.

CARTER (2 & 3) demonstrates the existence of flagellate cells ("*Spongozoa*," C.) in *Halysarca dujardini* and *lobularis*, and describes his experiments in colouring them by feeding them with carmine. He has traced the connection between the "ampullaceous sacs," formed by these "*Spongozoa*," with the pores or pore-canals, but was not able to determine their mode of communication with the excretory system. The presumed analogy between Sponges and compound Ascidians is also discussed, and the theory of the "*Spongozoa*" or flagellate cells as "individualized animals" still adhered to. The "seed-like" reproductive body (4) of the freshwater sponges is interpreted as "an assemblage of ova, which are at once developed together into a young *Spongilla*." The origin of the young spicules of different types in true nucleated cells is confirmed on fresh specimens of *Esperia cegagropila*, Johnst., and *Microciona armata*, Bk. (4 & 7). Carter also figures (4) the presumed spermatozooids of *Microciona atrosanguinea*, described by himself in 1870; he further describes and figures spermatozoid bodies discovered (dead) in *Grantia compressa*, and (living) in *Halysarca dujardini*; but these are the only instances in which he has met with anything like spermatozoa, though he has examined living sponges hundreds of times under the microscope. LEIDY (Remarks on Sponges, P. Ac. Philad. 1874, p. 144) supports the views of Carter, regarding the sponges "as compound flagellated *Infusoria*."

METSCHNIKOFF's studies of the evolution of Calcareous sponges (11) have essentially modified Hæckel's statements [Zool. Rec. ix. p. 474], which were apparently chiefly based on the comparison of the structure of the larva with that of the young sponge, without any positive knowledge of the transformations by which the latter is produced. The larva of *Sycon ciliatum* (*Sycandra raphanus*) is almost globular, but formed of two sub-equal halves, the anterior consisting of cylindrical flagellate cells, the posterior of roundish cells without cilia. The outer wall of the body is formed by fusion of these non-flagellate cells, and in this "syncytium" the calcareous spicula are developed; the ciliigerous portion is invaginated and becomes the endoderm. The anterior opening resulting from this invagination is only transitory; the fixed young sponge is completely closed up, apparently solid, and consists of

two concentric layers, the ectoderm, with the spicula, and the endoderm; the gastro-vascular cavity is formed somewhat later, but the "mouth" was still wanting in the most advanced stage observed. The syncytial skeletigerous outer layer of the sponge is not homologous with the ectoderm of the *Cæliterata*, but with the mesoderm; the true ectoderm exists, e. g., in larvæ of siliceous sponges, but disappears early. The body-cavity of different zoological types may, from a morphological point of view, be formed in very different manners; the whole argument and classification, which is built up from the homology of the "*Gastrula*" with the larvæ of other animals, is therefore devoid of any solid base.*

* This is the most proper place to notice E. Hæckel's "Die Gastræa-Theorie. Die phylogenetische Classification des Thierreichs und die Homologie der Keimblätter," Jen. Z. Nat. viii. pp. 1-55, pl. i. (translated by E. P. Wright in Q. J. Micr. S. xiv. pp. 142-165 & 233-247, pl. vii., abstracted by G. C. J. Schneider in Arch. Z. expér. iii. pp. 239-256; criticized by C. Claus in a special pamphlet, "Die Typenlehre und E. Hæckel's sogenannten *Gastræa*-Theorie," Wien, 1874, and by W. Salensky, "Bemerkungen über Hæckel's *Gastræa*-Theorie," Arch. f. Nat. xl. pp. 136-174. Cf. also C. Semper, "Kritische Gänge, iii., Die Keimblättertheorie und die Genealogie der Thiere," Arb. Inst. Würzb. i. p. 22). It is a further development of the ideas sketched in the "Monographie der Kalkschwämme" und "Ueber die Morphologie der Infusorien" [Zool. Rec. x. p. 523], and proposes, like the theory of E. Ray Lankester (*ibid.*), established about the same time, to replace the type-theory of Cuvier and Von Baër, or the doctrine of distinct architectural features for the chief divisions of the animal kingdom, by a genealogical exposition of the relations between its principal branches. Excluding the "*Monera*" from the animal kingdom, and relegating them to the *Protista*, his lowest division is that of the *Protozoa* (*Infusoria*, *Gregarina*, *Rhizopoda*); being typically unicellular, they do not, of course, afford any differentiation into Ectoderm and Endoderm, though these may be suggested by "*Exoplasm*" and "*Endoplasm*." All other (higher) animals are *Metazoa* or *Gastrozoa*: the pluricellular embryo or "*Gastrula*" is early differentiated into, at least, two cell-layers; the Endoderm or inner (vegetative) germ-leaf, and the Ectoderm or outer (animal) germ-leaf; in all the higher types, a third (or *Mesoderma*) is developed between the two primary layers. All *Metazoa* are typically (where the mouth, &c., is not lost through a retrograde development, as in some parasitical worms) provided with a mouth and stomach or intestine. The *Zoophyta* (*Cæliterata*, *Spongiæ*, *Acalephæ*, *Anthozoa*) and lower worms (*Acelomi*, *Plathelmintha*) have only this intestino-gastral cavity, but no true body-cavity (coeloma), which is in the higher branches of the animal kingdom formed by the separation of the secondary layers of the mesoderm. The *Zoophyta* and *Acelomi* therefore are truly bloodless animals (*Anæmaria*); a blood-fluid or "hæmolymp" cannot exist without or before the "coeloma," which is filled with transuding nutritive fluid from the gastral cavity, develops the nutritive organs, etc. The difference between the radiate *Zoophyta* and the bilateral worms is deduced—and this is apparently one of the most vulnerable points of the theory—from the oldest descendants of the common ancestor (*Gastræa*) becoming either fixed (*Protascus*) or creeping (*Prothelmis*). The higher worms (*Celomati*), the first blood-animals or *Hæmataria*, were developed from the *Plathelmintha*; from them again, the four higher "phylæ," *Mollusca*, *Echinodermata*, *Arthropoda*, and *Vertebrata* originated independently of each other. The *Gastrula* stage is still preserved in the first embryonal stage of *Amphioxus*; in all other *Vertebrata* it is passed over, owing to the, as Claus terms it, dangerous principle of the abridged evolution. Cf. also the classification of the animal kingdom, proposed by T. Huxley, Nature, xi. p. 101 [read before the Linnean Society, Dec. 4, 1874].

CARTER (6) has also observed some stages of the evolution of *Grantia compressa*, and describes them in almost the same manner; when issuing from the body of the parent, the embryo is ciliated on the larger portion of the body, but has at the posterior extremity (regarded wrongly by Hæckel as the anterior) a group of large non-ciliated cells, by means of which the young sponge is probably ultimately fixed. In *Haliscarca lobularis*, the egg is described in all its stages of duplicative subdivision until it issues as a ciliated embryo, rotating with the papillary projection turned forwards; at the posterior end, a group of "root-cells" is developed, apparently as the continuation of an inner (endodermal?) layer. The free swimming embryo of *Halichondria simulans* has a similar shape, ciliation, &c., but is further provided with a posterior circle of large flagella, just before the terminal ring or bunch of large cells; it contains only few spicula, while these are present in all shapes, characteristic of the species, in the still encysted embryo of *Esperia agagropila*. An intermediate stage, in which the large posterior cilia are still present, though the general ciliary covering has been lost and the group of "rooting cells" transformed into a basal attaching portion, leads to the last stage, the young but perfect sponge, in which the increasing development of the spicules elevates the investing membrane, a vent is formed, &c.

A note by E. R. LANKESTER on "the mode of occurrence of chlorophyll in *Spongilla*," Q. J. Micr. Sci. xiv. pp. 400 & 401.

Classification, Genera, and Species.

J. E. GRAY (8) has published a new edition of his Sponge System.

Leucandra cyathus, *Ascartis clarki*, *Leucosolenia (Ascartis) cancellata*, spp. nn., Verrill, P. Am. Ass. 1873, pp. 392 & 393 (Casco Bay).

HIGGIN (10) describes the spicular skeleton of a specimen of *Euplectella aspergillum*, in which it was only rigid at the base, but rather soft and yielding throughout the rest, the "vitreous" matter, in which the spicules are imbedded in the rigid portion, not being developed. The specimen perhaps represents the juvenile condition of the species, but all the specimens dredged by the "Challenger" off Cape St. Vincent were of the same kind.

Halichondria mackintoshi, Bowerbank, Ann. N. H. (4) xiii. p. 144 (St. Andrews); *H. simulans* (Bbk.), Carter (6), p. 331: *H. abyssi*, sp. n., Carter (5), p. 245, pls. xiv. figs. 26-28, xv. fig. 40, and *H. forcipis*, sp. n., id. l. c. p. 246, pls. xiv. figs. 29-32, xv. fig. 41 (between Scotland and Færø).

Haliscarca lobularis, Schm., Carter (3), pp. 434 & 435.

Halispongia ventriculoides (Spongia otahitica, Esper), Bowerbank (1), p. 301, pl. xlvii. figs. 1 & 2 (Otaheite), according to the author, nearly allied to the fossil *Ventriculites radiatus*, Mantell; *H. mantelli*, id. l. c. p. 303, pl. xlvii. figs. 3 & 4 (South Sea).

Geodia carinata, id. l. c. p. 298, pl. xlvi. figs. 1-5 (South Sea); *G. imperfecta*, id. l. c. p. 299, pl. xlvi. fig. 6; *G. reticulata*, id. l. c. p. 300, pl. xlvi. figs. 14-20 (Mexico).

Thecophora ibla, W. Th.; Verrill, Am. J. Sci. (5) vii. pl. viii. fig. 8.

Dorvillia echinata, sp. n. (? = *Thenia muricata*, Gray), *id. l. c.* p. 501, Coast of New England.

Guitarra fimbriata, g. & sp. nn., Carter (5), p. 210, pls. xiii. figs. 2-5, xv. fig. 34 (N. W. of British Isles). Sessile, conical, villous, the projecting extremities of the siliceous skeleton-spicules being arranged, somewhat spirally, in close tufts, and forming a tubular fringe around the apical vent, as in *Grantia*, while smaller vents are scattered over the surface generally; interior massive, permeated by excretory canals, charged with fusiform skeleton-spicules and equianchorate guitar-shaped flesh-spicules, and surrounded by a cortical layer, chiefly composed of the former.

Melananchora elliptica, g. & sp. nn., *id. l. c.* p. 212, pls. xiii. figs. 6-12, xv. fig. 35 (between Scotland and Færö). Free, globular, corrugated, studded with projecting tubercles on the upper two-thirds, smooth below; dermis stiff, glistening, bladder-like, supported by linear intercrossing spicules, enclosing a soft fibreless parenchyma; pores and vents in the cribriform tubercles; interior massive, permeated by excretory canals and charged with skeleton-spicules of two forms, and with melon-shaped equianchorate flesh-spicules.

Esperia villosa, sp. n., *id. l. c.* p. 213, pls. xiii. figs. 13-15, xv. fig. 36, and *E. cupressiformis*, sp. n., *id. l. c.* p. 215, pls. xiv. figs. 16-19, xv. fig. 37 (between Scotland and Færö). *Desmacidon (Esperia) anceps*, sp. n., O. Schmidt, Zweite deutsche Nordpolarfahrt, ii. (pt. 13) p. 430, pl. i. figs. 1-9. *E. fabricans* and *intermedia*, spp. nn., *id. l. c.* p. 433, figs. 10-12.

Chondrocladia virgata, W. Th.; Carter, *l. c.* p. 217, pls. xiv. figs. 20 & 21, xv. fig. 38.

Histoderma appendiculatum, g. & sp. nn., *id. l. c.* p. 220, pls. xiv. figs. 23-25, xv. fig. 39 (W. of Ireland). Free, subglobular, smooth, with several narrow tubular prolongations, formed, like the sponge itself, of a soft fibreless parenchyma, enclosed in a stiff, glistening, bladder-like dermis, supported by a dense layer of linear intercrossing spicules; pores and vents probably at the extremities of the tubes; interior massive, permeated by the excretory canals, and charged with simple skeleton-spicules of two kinds; flesh-spicules bihamate, equianchorate. [According to a note from the author, = *Cælosphæra tubifera*, W. Th.; Zool. Rec. x. p. 520.]

Cliona abyssorum, sp. n., *id. l. c.* p. 249, pls. xiv. fig. 33, xv. fig. 45 (in *Lophelia prolifera*).

Desmacella pumilio, Schm., *id. l. c.* p. 250, pl. xv. fig. 42.

Reniera fibulata, Schm., *id. ibid.* pl. xv. fig. 44.

Dictyocylindrus anchorata, sp. n., *id. l. c.* p. 251, pl. xv. fig. 43.

Gummina wallichii, sp. n., *id. l. c.* p. 252, pl. xv. fig. 46 (spicules from a sandy deposit, Agulhas Shoal, Cape of Good Hope); *Corticium* (g. n.) *kittoni*, sp. n., *id. l. c.* p. 253, pl. xv. fig. 48; and *Forcepia* (g. n.) *colonensis*, *id. l. c.* p. 248, pl. xv. fig. 47 (spicules from a sandy deposit, Colon, Panama).

On *Aulorhipis*, cf. *suprà*, p. 498.

FOSSIL SPONGES AND ALLIED FORMS.

H. A. NICHOLSON: On the affinities of the genus *Stromatopora*, with descriptions of two new species; Ann. N. H. (4) xiii. pp. 4-14 (the evidence is, according to the author, decidedly in favour of *Stromatopora* being referable to the *Calcispongia*). E. C. DAVEY: The Sponge-gravel beds at Coxwell, near Faringdon; a paper contributed to the Newbury Field Club, 1874, 8vo, 14 pp., 18 photographs of fossils; abstract, Geol. Mag. (2) i. p. 228 (16 species of Sponges described). DEVALQUE's paper on *Astræospongium* reprinted, Z. Zool. ii. pp. 292-294. MEYER, "Silurische Schwämme und deren eigenthümliche Verbreitung," Z. geol. Ges. xxvi. pp. 41-58 (cf. DAMES, Ueber Spongien von Gotland, tom. cit. pp. 613 & 614).

INFUSORIA.

1. CLAUS, C. Bemerkungen zur Lehre von der Einzelligkeit der Infusorien. Verh. z.-b. Wien, xxiv. pp. 25-36.
2. GREEFF, R. Ueber den Bau der Vorticellen. Entgegnung an Hrn. Dr. Everts in Haag. SB. Ges. Marb. 1874, pp. 5-20.
3. LANKESTER, E. R. *Torquatella typica*, a new type of *Infusoria*, allied to the *Ciliata*. Q. J. Micr. Sci. xiv. pp. 272-274, pl. xii. figs. 1-5.
Body oblong, mobile, without cilia, but provided anteriorly with a large, plicate, vibrating collar, surrounding also the mouth, which is overhung by a capitular prominence or upper lip; might form a new division, *Calycata*, of the *Infusoria stomatoda*. Naples (not parasitic).
4. LEIDY, J. Notice of some fresh-water *Infusoria*. P. Ac. Philad. 1874, p. 140 (*Cothurnia*, *Dendrosoma*).

Short records of W. H. DALLINGER & J. DRYSDALE's continued researches into the life-history of Monads are given, Q. J. Micr. Sci. xiv pp. 102 & 103, 201 & 202. A. HUMBERT has reported on several papers on *Infusoria*, by Hæckel, Bütschli, Everts, and others, Arch. Sci. nat. xlix. pp. 67-74 (J. Zool. iii. pp. 215-219), and on Balbiani's treatise on *Didinium*, l. c. pp. 159-62.

RHIZOPODA.

1. GREEFF, R. Ueber Radiolarien und radiolarienartige Rhizopoden des süßsen Wassers. Arch. mikr. Anat. xi. pp. 1-32, pls. i. & ii.
2. HERTWIG, R. Ueber *Microgromia socialis*, eine Colonie bildende Monothalamie des süßsen Wassers. Op. cit. x. Supplementheft, pp. 1-34, pl. i.
3. — & LESSER, E. Ueber Rhizopoden und denselben nahestehenden Organismen. L. c. pp. 35-243, pls. iii.-v.

4. LEIDY, J. Remarks on *Protozoa*. P. Ac. Philad. 1874, pp. 13-15.
 —. On *Actinophrys sol.* Tom. cit. pp. 23 & 24.
5. —. Note on the enemies of *Diffugia*. Tom. cit. p. 75; Am. J. Sci. (3) viii. pp. 223 & 224; Ann. N. H. (4) xiv. p. 377.
6. —. Notice of some new fresh-water Rhizopods. P. Ac. Philad. 1874, pp. 77-79; Am. J. Sci. (3) viii. pp. 224-226; Ann. N. H. (4) xiv. pp. 383-385.
7. —. Notice of a remarkable *Amæba*. On the mode in which *Amæba* swallows its food. P. Ac. Philad. 1874, pp. 142-172; Am. J. Sci. (3) viii. pp. 155 & 156.
8. —. Notice of some fresh-water and terrestrial Rhizopods. P. Ac. Philad. 1874, pp. 86-88; Am. J. Sci. (3) viii. pp. 70-72; Arch. Sci. nat. lii. pp. 166 & 167.
9. RYMER-JONES, F. W. OWEN. On some recent forms of *Lagenæ* from deep-sea soundings in the Java Seas. Tr. L. S. xxx. p. 45-69, pl. xix.
10. SCHNEIDER, A. Bemerkungen zur Entwicklungsgeschichte der Radiolarien. Z. wiss. Zool. xxiv. pp. 579 & 580.
11. SCHULTZE, F. E. Rhizopodenstudien, I. Arch. mikr. Anat. x. pp. 328-350, pl. xxii. II. L. c. pp. 377-400, pls. xxvi. & xxvii. III. *op. cit.* xi. pp. 94-139, pls. v.-vii.
12. WINTHER, G. Fortegnelse over de i Danmark levende Foraminiferer. Nat. Tids. (3) ix. pp. 100-132.

Distribution.

Forty-two species of *Foraminifera* are enumerated (12) from the Danish Seas. A great number of *Rhizopoda*, with few exceptions, all from fresh-water in Germany (Bonn, Marburg, Graz, &c.), are described by the German authors quoted above (1-3 & 11). EHRENBURG has contributed to the Report on the 2nd German North Polar Expedition (Zweite Deutsche Nordpolarfahrt, ii. pp. 437-467, pls. i.-iv.) a chapter on the *Microzoa* (*Foraminifera*, *Rhizopoda*, *Radiolaria*, *Diatomacea*, &c.) of the arctic zone, with tables illustrating the bathymetrical distribution of the marine and the geographical distribution of the terrestrial forms.

Classification, Genera, and Species.

Under the name of *Sarcodina*—almost equivalent to the *Rhizopoda* of M. Schultze—Hertwig & Lesser (3) comprise the groups elsewhere spoken of as *Monera*, *Amæbina*, *Heliozoa*, and *Polythalamia*. The systematic relations of this great group with other inferior organisms (*Radiolaria*, *Mycetozoa*, *Noctiluca*, *Flagellata*, *Catallacta*, *Ciliata*, *Acineta*, *Gregarinæ*), the value of the characters employed in classification, and the systems proposed by modern investigators are elaborately discussed. Leaving aside the *Foraminifera* and several forms, the affinities whereof are dubious

(*Hyalodiscus*, *Dactylosphaerium*, *Leptophrys*, *Vampyrella*, *Cochliopodium*), the fresh-water *Sarcodina* examined by the authors are arranged in the following manner:—

I. MONOTHALAMIA.

1. *M. Monostoma*: one orifice only on the shell for the pseudopodia.
 - A. *M. Lobosa*. (a) Shell the product of secretion only (*Arcella*, *Pseudochlamys*, *Pyxidicula*).
 - (b) Shell incrustated with foreign bodies (*Diffugia*).
 - B. *M. Rhizopoda*. (a) Shell the product of secretion only: α , structureless (*Plagiophrys*, *Lecythium*); β , distinguished by delicate structural detail (*Euglypha*, *Cyphoderia*).
 - (b) Shell incrustated with foreign bodies (*Pleurophrys*).
2. *M. Amphistomata*: two orifices, almost opposite, for the pseudopodia.
 - (a) Shell the product of secretion only (*Diplophrys*).
 - (b) Shell encrusted (*Amphitrema*).

II. HELIOZOA (which are not acknowledged as "fresh-water Radiolaria" or as related to the Radiolaria).

- A. *H. Askeleta* (*Actinophrys*, *Actinosphaerium*).
- B. *H. Sceletophora*. (a) *Chalarothoraca* (shell composed of very small pieces): *Acanthocystis*, *Pinacocystis*, *Heterophrys*, *Rhaphidiophrys*, *Hyalolampe*.
 - (b) *Desmothoraca* (shell of a single piece) (*Hedriocystis*, *Cla-thrulina*).

Ouramæba [Ur-], g. n., Leidy, different from *Amæba* (pr.) in being provided with tufts of simple, unbranched, tail-like appendages, projecting from the back part of the body; these rays are not retractile, quite different from the pseudopods, and rigid and coarse compared to the delicate rays of *Actinophrys*. *O. vorax* and *lupsa*, spp. nn., Leidy (6), and two unnamed forms. A similar creature has been observed by Archer, Q. J. Micr. Sci. xiv. p. 212.

Deinamæba [Din-] *mirabilis*, g. & sp. nn., Leidy (7), p. 142. Spherical, oval, or constricted, opaque, sluggish, protruding from both extremities numbers of long acute pseudopods, bristling everywhere, like the surface of the body, with minute spicules.

Diffugia lobostoma, *crenulata*, *entochloris*, *amphora*, spp. nn., *id.* (6), *D. acropodia*, sp. n., Hertwig & Lesser (3), pp. 105–110, pl. ii. fig. 6. A transparent *Diffugia*, distinguished by its membranous, structureless investment, connected by long threads with the soft granular contents, probably *D. ligata*, Tat., is made the type of *Catharia*, g. n.; Leidy (6).

Amæba zonalis, sp. n., *id. l. c.*; *A. (Pelomyxa) sabulosa*, sp. n., a sluggish creature containing an enormous quantity of quartzose sand, *id. l. c.*

Gromia terricola, sp. n., Leidy (8), in the earth, about the roots of mosses that grow in the crevices of the bricks of city pavements, probably contracted and quiescent during droughts, but expanding its nets

in rains or wet weather. *Gromia oviformis*, Duj., Schultze (11, iii.), p. 116 (Baltic); *G. granulata*, sp. n., *id. l. c.* pp. 117 & 118, pl. vi. figs. 5 & 6; *G. socialis*, Cart., *id. l. c.* pp. 118-122, pl. vi. figs. 7-13 (several individuals often unite, forming "colonies" through fusion of their pseudopodia). Absence of contractile vacuole confirmed.

Arcella vulgaris, E.; Hertwig & Lesser (3), pp. 96-99. Shell disc- or shield-shaped, formed of two parallel plates, connected by a hexagonal meshwork; pseudopodial orifice central, inferior; numerous nuclei and contractile vacuoles.

Pseudochlamys patella, Cl. & Lm.; *id. l. c.* pp. 100-103, pl. iii. fig. 1. Shell roundish, shield-shaped, the concavity closed by a thin membrane, with the exception of a central orifice for the pseudopodia, which are finger-shaped and homogeneous; sarcodal body discoid, with an almost central nucleus and numerous peripheral contractile vacuoles.

Pygidicula operculata (Ehrb.) (*Arcella patens*, Cl. & L.); *id. l. c.* pp. 103-105. Shell discoid, irregularly tuberculated, upper aboral portion convex, lower surface chiefly occupied by the orifice for the pseudopodia; sarcodal body discoid, with a single nucleus and numerous contractile vacuoles.

Plagiophrys cylindrica, Cl. & Lm.; Schultze (11, iii.), p. 126, pl. vii. fig. 9. *P. sacciformis* and *scutiformis*, spp. nn., Hertwig & Lesser (3), pp. 113-117, pl. iii. figs. 2 & 3. Shell thin, membranaceous, somewhat pliable, covering the body immediately; nucleus single, no contractile vacuoles; pseudopodia pointed, branched, not anastomosing.

Lecythium (g. n.) *hyalinum* (Schlmb.), Hertwig & Lesser (3), pp. 117 & 118, pl. iii. fig. 8. Shell roundish, hyaline, thin, membranaceous, not pliable, symmetrical, with a short neck in which is the pseudopodial orifice; pseudopodia homogeneous, highly ramified, sometimes anastomosing; sarcodal body filling the shell, anterior portion granulated with numerous non-contractile vacuoles, posterior homogeneous, containing a single nucleus.

Euglypha alveolata, Duj., Schultze (11, iii.), pp. 97-101, pl. v. figs. 1 & 2; *E. compressa*, Carter, *id. l. c.* pp. 101 & 102, pl. v. figs. 3 & 4; *E. globosa*, C., *id. l. c.* pp. 102-104, pl. v. figs. 5-8 (= *Sphenoderia*, Schlmb.?). One or more pulsatile vacuoles and a single nucleus are present; the shell is composed of circular or oblong, small, imbricate, siliceous plates, those limiting the orifice often denticulate; the entire membranaceous orifice which sometimes occurs in specimens of *E. globosa*, in which no pseudopodia are observable, is perhaps an indication of a quiescent state of the animal. *E. globosa* and *alveolata*, and *E. ampullacea*, sp. n., are also described by Hertwig & Lesser (3), pp. 121-132, pl. iii. figs. 5-7. The plates are here described as hexagonal. In the encysted *Euglypha*, the orifice of the shell is closed by foreign matter, and the body surrounded by an oblong tessellated and closed shell and an inner punctulate siliceous capsule. "Shell ovoid or flask-shaped, composed of hexagonal plates, arranged in regular spirals, with the pseudopodial orifice at the extremity; pseudopodia homogeneous, ramose, not anastomosing; anterior portion of the sarcodal body granular, posterior homogeneous with a single nucleus; contractile vacuoles between both portions."

Trinema acinus, Duj., Schultze (11), iii. pp. 104–106, pl. v. figs. 9–11 (= *Diffugia enchelys*, Ehrbg.). Differs chiefly from *Euglypha* by the orifice of the shell being entire and placed centrally; Hertwig & Lesser (3), pp. 119–121.

Cyphoderia margaritacea, Schlumb. (*Lagynis baltica*, M. S.), Schultze (11, iii.), pp. 106–113, pl. v. figs. 12–20. Shell chitinous, but composed of small plates of a similar shape to those of *Euglypha*; orifice denticulate, but with an entire membranaceous rim; nucleus and pulsatile vacuoles present. Also described by Hertwig & Lesser (3), pp. 132–135. Shell retort-shaped, composed of regular hexagons, neck obliquely cut, the orifice for the pseudopodia, which are ramified, homogeneous and anastomosing; numerous contractile vacuoles in the anterior portion of the sarcodal body, a single nucleus in the posterior. *C. truncata*, sp. n., Schultze, l. c. pp. 113–115, pl. v. figs. 21 & 22.

Platium parvum, g. & sp. nn., Schultze (11, iii.), pp. 115 & 116, pl. vi. figs. 1–4. Shell hyaline, structureless, oviform, elastic, with a small round orifice at the narrow extremity, not quite filled by the sarcodal body, which contains one nucleus and one or two small pulsatile vacuoles (Baltic).

Actinolophus pedunculatus, g. & sp. nn., Schultze (11, iii.), pp. 392–398, pl. xxvii. figs. 1–9. Allied to *Lecythia*, Wr., or *Zooteira*, Wr.?. Fixed by a longitudinally striated stem to Hydroids or *Algæ*; sarcodal body typically pyriform, with pseudopodia only on the distal portion, no contractile vacuole, a single nucleus; the pseudopodia are imperfectly retractile, perhaps because the body is surrounded by an invisible layer, though apparently naked. Other specimens are really enclosed, body and stem, in a distinct gelatinous covering, on the surface of which small, hexagonal siliceous plates are developed; the pseudopodia are subsequently withdrawn, the nucleus divided, the stem shortened, &c. (Baltic).

Pleurophrys amphitrematoides, Arch., Schultze (11, iii.), pp. 123 & 124, pl. vii. fig. 1; *P. fulva*, Arch., *id.* l. c. pp. 124 & 125, pl. vii. figs. 2 & 3; *P. compressa*, sp. n., *id.* l. c. p. 125, pl. vii. figs. 4 & 5; *P. lageniformis*, sp. n., *id.* l. c. pp. 125 & 126, pl. vii. figs. 6–8 (Baltic). No chlorophyll in *P. amphitrematoides*; conjugation with shell orifices in apposition not uncommon. *P. sphaerica*, Cl. & Lm.; Hertwig & Lesser (3), pp. 135–137, pl. iii. fig. 4. Shell irregularly oval, formed of small siliceous bodies connected by an organic cement; nucleus present; pseudopodia thin, granu-ligerous, ramified and anastomosing.

Diplophrys archeri, Bark.; Schultze (11, iii.), pp. 127–132, pl. vii. figs. 10–15. Single or in colonies (*Cystophrys ocula*, Arch.), probably produced by fission (Greeff, 1, pp. 14–16). Also described by Hertwig & Lesser (3), pp. 139–145, pl. iii. fig. 3. Shell roundish or ovoid, smooth, covering the body immediately, with two, not quite opposite, orifices for the pseudopodial stems; pseudopodia homogeneous, rarely branched, not anastomosing; nucleus central; several contractile vacuoles; one large or several smaller fat-like globules.

Microgromia (g. n.) *socialis*, Hertwig (2) (= *Cystophrys heckeliana* and *Gromia socialis*, Arch.), occurs in a double shape; the individual cells

remote from each other, but connected by a loose meshwork of anastomosing pseudopodia (the spring form), or clustered together in an irregular globular mass (the summer form); provided with hyaline rigid shells with a short neck, through which the pseudopodial stem is emitted; the sarcodal body only adheres to the shell at the periphery of the orifice and contains posteriorly a nucleus, anteriorly one or two contractile vacuoles. The colonies increase by longitudinal (?) division of the sarcodal bodies, for instance, into three, two of which leave the shell, assuming amoeboid or *Actinophrys*-like shapes and movements, but remaining in connection with the pseudopodial stems of the mother-cell. New colonies are formed by transverse fission, the new individuals being from the first completely cut off from that remaining in the shell; after having left which, they assume a creeping amoeboid shape, or turn into "swarmers" provided with cilia.

Hyalodiscus rubicundus, g. & sp. nn., Hertwig & Lesser (3), pp. 49-54, pl. ii. fig. 5. Body discoid, rather convex, without shell or pseudopodia, differentiated into a homogeneous ectosarc and a granular endosarc with nucleus and contractile (?) vacuoles, rotated by the uniform contractility of the sarcode, the elements of which are in continual motion.

Dactylosphaerium vitreum, g. & sp. nn., *iid. l. c.* pp. 54-57, pl. ii. fig. 1. Body roundish, formed of hyaline homogeneous protoplasm, with numerous imbedded green or yellow granula; surface often villous; pseudopodia conical, finger-shaped.

Leptophrys cinerea and *elegans*, g. & sp. nn., *iid. l. c.* pp. 57-61, pl. ii. figs. 3 & 4. Body irregular, formed of a very delicate film-like sarcode, produced into lobes, which give off the pointed, non-ramified pseudopodia especially from their extremities; parenchyme regularly filled to the margin with small non-contractile vacuoles, which are, like the granula, of uniform size; several nuclei.

Vampyrella spirogyræ, Cienk.; *iid. l. c.* pp. 61-65, pl. ii. fig. 2. Body irregularly globular, but capable of changing its shape, like an *Amæba*, impregnated by a diffuse pigment with the exception of a narrow hyaline border, which contains a few non-contractile vacuoles; pseudopodia delicate, pointed, rarely branched; encysts itself, after having fed, in a cyst of cellulose, which it leaves again, dividing into 2-4 individuals.

Cochliopodium pellucidum, g. & sp. n., *iid. l. c.* pp. 66-78, pl. ii. fig. 7 (= *Amphizonella vestita*, var., Arch., = *Amæba bilimbosa* and *actinophora*, Auerb.). Shell supple, pliable, of *Araella*-like structure, with a highly dilatable orifice for the bundle of pseudopodia; sarcodal body variable in shape; one nucleus in the back part of the shell; two or more contractile vacuoles close under the shell; pseudopodia without granules, conical, rarely branching. *C. pilosum*, sp. n., *iid. l. c.* p. 78.

Actinophrys sol (Ehrbg.); *iid. l. c.* pp. 164-176, pl. v. fig. 2. Body regularly globular, completely vacuolated, with the exception of the central homogeneous protoplasm-mass; a single contractile vesicle, prominent above the body surface; a central nucleus with distinct membrane and nucleolus; pseudopodia with axial filament, granuliferous, not branching, and rarely anastomosing.

Actinosphaerium eichhorni (Ehrbg.): Schultze (11, i.). Only two layers can be distinguished, the cortical with fewer granula and larger alveoli, and the medullary with more numerous granula and smaller alveoli, but, in the peripheral portion, with 1-150 nucleolated nuclei; the pseudopodia are stiffened by an organic axial skeleton, the hyaline rays of which terminate abruptly in a cuneiform base against or in the surface of the central layer; one or two pulsatile vacuoles in the cortical layer; when preparing for propagation, early in winter, the pseudopodia are withdrawn, a gelatinous covering is secreted, and its contents divided into 10-30 germ-balls, each containing one nucleus, and, when mature, enclosed in a siliceous shell; the young *Actinosphaerium* has a single peripheral layer of large alveoli and a single nucleus. Also described by Hertwig & Lesser (3), pp. 176-178, pl. v. fig. 1.

Lithocolla globosa, g. & sp. nn., Schultze (l. c. ii.), p. 389, pl. xxvi. figs. 6-10. Densely covered by small sand-grains, &c., held together by the sarcode, from which radiate delicate pseudopodia (Baltic, littoral).

Chondropus viridis [Zool. Rec. x. p. 530], Greeff (1), p. 27, pl. ii. fig. 18. Globular, filled with green, small, rod-like bodies, &c.; pseudopodia radiating (Lahn-river).

Astrocococcus rufus [Zool. Rec. x. p. 530], *id.* l. c. pp. 27 & 28, pl. ii. fig. 19. Similar, but without green globules or rod-like bodies.

Heliophrys variabilis [Zool. Rec. x. p. 530], *id.* l. c. pp. 28 & 29, pl. ii. figs. 20-23. Globular or discoid, with a thick, hyaline, homogeneous, cortical layer, with rod-like granula on the surface; several nuclei and non-contractile vacuoles; pseudopodia ordinarily not ramified. According to Hertwig & Lesser (3), identical with *Heterophrys varians*, Schultze (11, ii.), pp. 386-389, pl. xxvi. figs. 3-5; naked or surrounded by a hyaline, extremely delicate, structureless substance; three to six nuclei; pulsatile vacuoles often in great number; pseudopodia without axial skeleton; sometimes withdrawing the pseudopodia and transformed into quiescent balls without pulsatile vacuoles, &c. (*Nuclearia*, Cienk.?). Cf. also Hertwig & Lesser (3), pp. 60 & 61, who deny the existence of the normal layer outside the body in those specimens which are surrounded, at some distance, by minute rod-like bodies. At all events, generically distinct from *Heterophrys myriapoda*, Archer; Greeff (1), pp. 21-23, pl. i. figs. 8 & 9; radial immersed siliceous spicula (?) in small numbers or wanting; sarcode-ball filled with green globules, surrounded by a narrow hyaline and a broader granular layer, from which radiate pseudopodia of two sizes; also a variety with numerous, short, rod-like bodies in the outer layer in the place of granula.

Heterophrys spinifera and *marina* (from sea-water), Hertwig & Lesser (3), pp. 211-217, pls. iv. fig. 4, v. fig. 3. Skeleton formed of an apparently granular, spongy, siliceous (?) substance, with numerous short or long, delicate, radiating spines; pseudopodia long, granuligerous, neither ramified nor anastomosing; sarcodal body differentiated into endosarc (with one nucleus) and ectosarc (with contractile vacuoles).

Rhaphidiophrys pallida, sp. n., Schultze (11, ii.) pp. 377-385, pl. xxvi. figs. 1 & 2. No chlorophyll-balls; the peripheral siliceous spicules are held together only by the pseudopodia and by slight expansions of their

sarcode; the axes of the pseudopodia radiate from a small globule occupying the centre of the solitary sarcodal ball, which contains one nucleus and ten to twenty peripheral pulsatile vacuoles. Evidently generically distinct from this, is *R. elegans*, Hertwig & Lesser (3), pp. 218-220, pl. iv. fig. 1, often aggregate, the individuals connected by sarcodal bridges and surrounded by small curved spicules; one nucleus; chlorophyll-balls present; pseudopodia long, not branched, containing granules. In habit, very like *Sphaerastrium conglobatum* [Zool. Rec. x. p. 530], Greeff (1), pp. 29 & 30, pl. ii. figs. 24-26; colonies of ten to twelve globular actinophryoid Rhizopods, connected by sarcodal strings and a sinuous fringe of thin protoplasm; nucleus central.

Acanthocystis viridis (Ehrbg.) (*turfacea*, Cart.); Greeff (1), pp. 3-14, pl. i. figs. 1-4. From the small central cavity of the so-termed "central capsule," delicate filaments radiate through the sarcode-ball into the pseudopodia; radiating siliceous spicules of two kinds, large, slightly-forked and smaller, strongly bifurcate, but with basal expansions resting on the surface of the body; also curved tangential spicules; during encystation, a siliceous trellis-ball is formed below the spicular skeleton. *A. flava*, sp. n., Greeff (1), pp. 17 & 18, pl. i. fig. 1; *spinifera*, id. l. c., pp. 14-17. *A. viridis* and *turfacea* are also described by Hertwig & Lesser (3), pp. 193-201 & 204-209, pl. iv. fig. 3; *A. aculeata*, sp. n., *id. l. c.* pp. 201-203, pl. iv. fig. 2. "Skeleton chiefly formed of spines with basal dilatations, sarcodal body differentiated into the homogeneous endosarc (one nucleus), and granular ectosarc (several contractile vacuoles), pseudopodia long, thin, not branched, granuligerous."

Hyalolampe (g. n.) *fenestrata*, Greeff (1), pp. 18-20, pl. i. figs. 6 & 7 (*Pompholygophrys punicea*, Arch.), Hertwig & Lesser (3), pp. 220-222; *H. exigua*, *id. l. c.* pp. 222-224, pl. iv. fig. 6 (= *Astrodisculus*, several species described by Greeff). Skeleton formed of several layers of isolable siliceous globules; during encystation, a second, inner, poriferous, siliceous capsule is developed; protoplasm granulose; one nucleus; vacuoles not contractile; pseudopodia not granuligerous, rarely dichotomous.

On a problematic Rhizopod, allied to *Astrodisculus*, cf. Archer, Q. J. Micr. Sci. xiv. pp. 317 & 318.

Elæorhania cincta [Zool. Rec. x. p. 530], Greeff (1), pp. 23-26, pl. i. fig. 10. A hyaline ball enclosing an oil like globule, and surrounded by a thin layer of sarcode, partly concealed by sand-grains, diatoms, &c.; pseudopodia radial. Connected with *Diplophrys*?

Pinaciophora fluviatilis [Zool. Rec. x. p. 530], *id. l. c.* pp. 26 & 27, pl. i. figs. 15-17. Surrounded (at some distance) by a shell composed of small siliceous, perforated plates, which are traversed by the pseudopodia; a central capsule (endosarc?) is present (Rhine). Has much in common with the following genus.

Pinacocystis rubicunda, g. & sp. nn., Hertwig & Lesser (3), pp. 209-211, pl. iv. fig. 5. Skeleton formed of small roundish, neither imbricated nor perforated plates, without spines, &c.; sarcodal body differentiated into endosarc (with single nucleus) and ectosarc (with granules of different size); contractile vacuoles none (Marine).

Hedriocystis pellucida, g. & sp. nn., *id. l. c.* pp. 225-227, pl. v. fig. 5.

Shell fixed by a stem, roundish-oval, with pointed protuberances, the extremities of which are perforated for the exits of the granular, unramified, non-anastomosing pseudopodia; sarcodal body (with central nucleus, and one or several peripheral contractile vacuoles) suspended in the shell by means of the perforating pseudopodia.

Clathrulina elegans, Gienk.; *ibid.* l. c. pp. 227-235, pl. v. fig. 4. Skeleton a trellised siliceous ball, in a single piece, mounted upon a longish, tubular, distally fibrillate stem; sarcodal body provided with numerous contractile vesicles and a central nucleoligerous nucleus; pseudopodia numerous, granuligerous, ramified, and anastomosing. Propagation by division, *e. g.*, into three, of which two free themselves through the interstices of the shell as ovate flagellate "swarmers." The stem is formed before the shell, as in the young animal of *Hedriocystis*. Note on *Clathrulina* by Leidy, P. Ac. Philad. 1874, p. 145.

Spiroloculina hyalina, sp. n., Schultze (11, iii.), pp. 132 & 133, pl. vi. figs. 14-16, and *Quinqueloculina fusca*, Br., *ibid.* l. c. pp. 134-136, pl. vi. figs. 19 & 20 (both from the Baltic).

Several Arctic *Rhizopoda*, *Foraminifera*, and *Radiolaria*, are referred to and figured by Ehrenberg (Zweite Deutsche Nordpolarfahrt, ii. Zoologie, pt. 15, pp. 437-467, pls. i.-iv.); many of the species are given as new, of which diagnoses were published in MB. Ak. Berl. 1872. K. Miller enumerates the *Foraminifera* (13 spp.) collected at Spitzbergen (Heuglin, Reisen, l. c. p. 262).

On foraminiferal life in the Southern Sea, and the relation between these organisms and the different character of the sea-bottom deposits at different depths, *cf.* C. WYVILLE THOMSON'S "Preliminary notes." Nature, x. pp. 142-144, xi. pp. 95-97, & 116-119, or P. R. Soc. xxii. pp. 423-428 & xxiii. pp. 32-49, pls. i.-iii. (especially on "*Globigerina-ooze*").

Thirty-one varieties of *Lagena vulgaris*, Will., found (together with many other *Foraminifera*, *Polycystinea*, Diatoms, &c.) in a packet of mud from a depth of 1080 fathoms, 10 miles south of Sandalwood Island, are described and figured by R. JONES (9). A paper by D. ROBERTSON on the recent *Foraminifera* of the Firth of Clyde, read before the Geological Society of Glasgow, April 16th, 1874, has not been seen by the Recorder. A note on the "*Bathybius*" question; Q. J. Micr. Sci. xiv. pp. 97-99. An organism of a still lower type than *Bathybius* (*Protobathybius robesonii*), discovered by the "Polaris" Arctic Expedition off Grinnell Land, is announced in Nature, ix. p. 405, quoting advanced sheets of the Report of the Secretary of the U. S. Navy.

FOSSIL RHIZOPODA AND ALLIED FORMS.

H. B. BRADY: On a true carboniferous Nummulite; Ann. N. H. (4) xiii. pp. 222-230, pl. xiii. (abstract, J. Zool. iii. pp. 336-340). L. G. BORNEMANN: Ueber die Foraminiferen-gattung *Involutina* (Z. geol. Ges. xxvi. pp. 702-740, pls. xviii. & xix.) (two new genera, *Silicina* and *Problematina*). R. ETHERIDGE: On the occurrence of *Foraminifera* in the carboniferous limestone of the east of Scotland (Tr. Geol.

Soc. Edinb. ii. 2). C. W. GÜMBEL: Ueber neue Gyroporellen aus dem Gailthaler Gebirge (Verh. geol. Reichsanst. 1874, p. 79). Id. *Conodicytum bursiforme*, Étallon, einer Foraminifere [*Petrascula*, g. n., p. 292] aus der Gruppe der Dactyloporideen (SB. bayer. Ak. 1873, iii. pp. 282-294, pl. i.; abstract, JB. f. Mineral. 1874, p. 327). T. R. JONES: On some *Foraminifera* in the chalk of the north of Ireland (J. R. Geol. Soc. Irel., iii. p. 88). P. DE LA HARPE: Note sur les Nummulites de Crimée; Bull. Soc. Vaud. (2) xiii. pp. 267-272.

Eozoon Controversy. Papers by J. W. DAWSON, T. S. HUNT, W. KING, and T. H. ROWNY, in P. R. Irish Ac. x. p. 4, and (2) i. pp. 2-8; by H. J. CARTER, W. B. CARPENTER, M. SCHULTZE, W. KING, T. H. ROWNY, W. K. PARKER, T. R. JONES, and H. B. BRADY, in Ann. N. H. (4) xiii. pp. 189-193, 277-284, 324 & 325, 376, 379 & 380, 390-396, 456-470; *op. cit.* xiv. pp. 64-67, 138, 274-288, pl. xix.; pp. 371 & 372; by J. W. DAWSON, Nature, x. p. 103.

GREGARINIDÆ.

A note on parasitic disease in chickens, caused by Gregarines. Veterinarian, xlvii. pp. 372-374.

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INCLUDING NAMES PROPOSED FOR GENERA ALREADY
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[The symbol || indicates that the name to which it is affixed has been used before in Zoology.]

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